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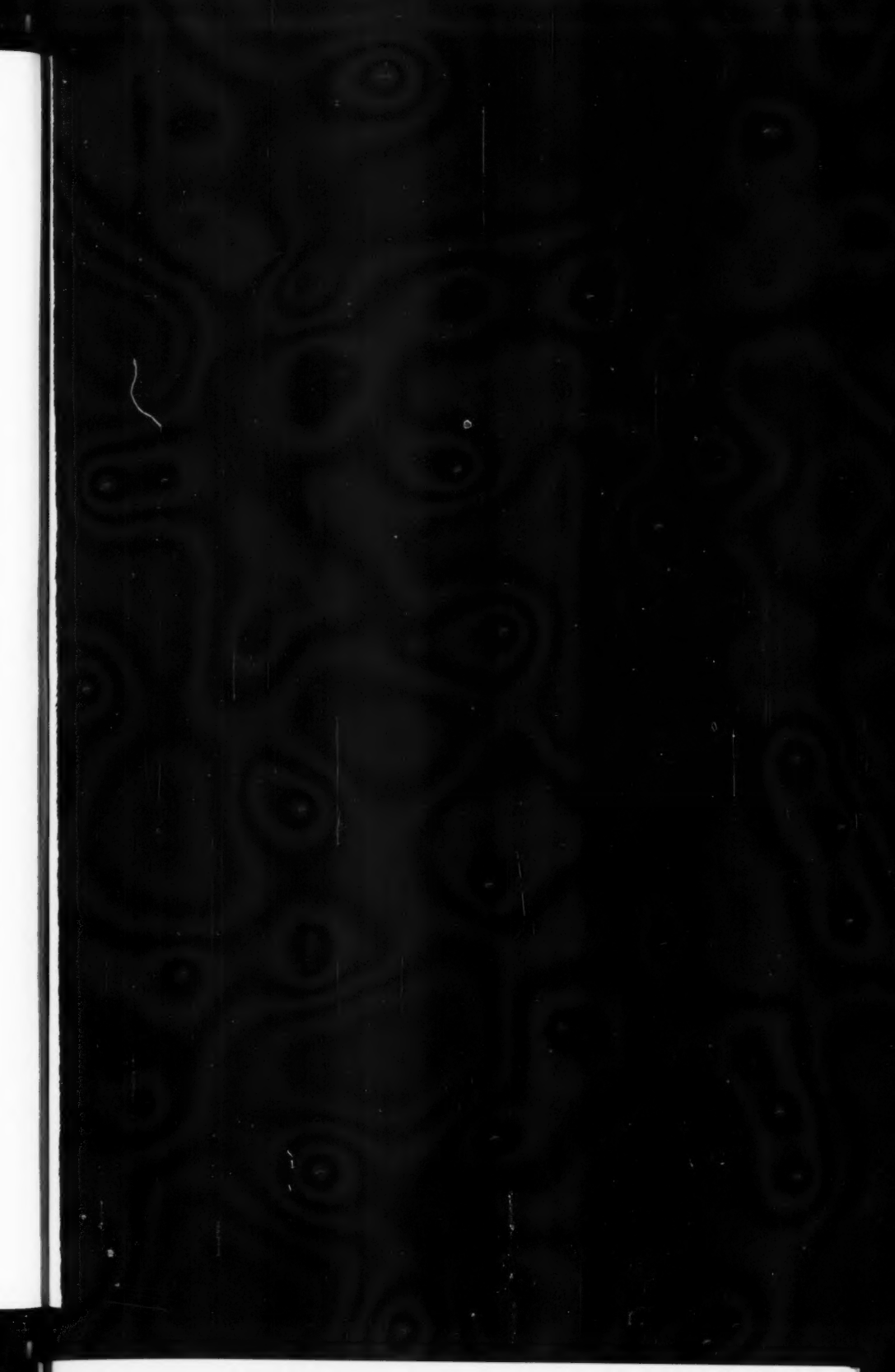

BIRD-BANDING

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BARN SWALLOW LIFE HISTORY DATA BASED ON BANDING RECORDS*

BY EDWIN A. MASON

Barn Swallow *(Hirundo rustica erythrogaster)* records totalling 2,469 nestlings and adults banded and 654 return records were accumulated by the Wharton Bird Banding Station, Groton, Mass., during the period 1929-1942. The technique of taking adults as initiated by Davis (1936) was used for the first time in 1933. It was obvious that this method of banding mature birds, and especially the possibilities opened up of subsequently catching as returns individuals banded as both adults and nestlings, would result in the acquisition of data previously impossible of attainment. Thus under the impetus of this new technique, greater efforts were also made to band nestlings in the hope of learning more about their distribution through their subsequent recapture.

The combined operations of the Wharton and Davis Stations during the years 1932-1936 resulted in the banding of birds in some 30 odd barns within about an 8-mile radius of Groton. The construction features of some barns are such that excellent coverage is possible, while in others the reverse is true. This applies to both the banding of young in the nest, and the taking of adults at night with flashlight and hand net. It was unfortunate that conditions arose which made it impossible for the Davis Station to continue beyond the period reported on by them *(loc. cit.)*, for the total number of banded birds in the area was becoming such that return records could be expected with increasing frequency. The interchange of birds thus stopped in 1936, frustrating the hope of accumulating a volume of data on inter-barn movements in the large area covered cooperatively, although the value of other types of data increased as the study was continued by the Wharton Station alone.

BROOD SIZES

The records of 1,939 nestlings banded are available to show brood sizes. Based as they are upon the numbers of nestlings in individual nests banded, corrected occasionally when an especially small nestling had to be left unbanded, they are referred to as "Viable nestlings per brood." The ideal time to band nestling Barn Swallows is when they are about 7 days old. Prior to that time tarsi and feet are so small as to make the operation difficult to perform, and there is some possibility that the band might slip off. Tarsi grow, then shrink as they harden off. Size 1 bands were used. There is the definite danger, if banding

*Contribution from the Wharton Bird Banding Station, Groton, Mass. Acknowledgment is made by the author of the assistance and continued interest in this study by William P. Wharton.

is delayed beyond the point where the wing primaries have broken through the sheath, that the nestlings will not remain in the nest after being replaced subsequent to being banded. Therefore, to band all the reproduction of a given colony, several visits must be made. It was found extremely helpful to mark each occupied nest by chalking up a number nearby. With nests thus definitely identified, it was possible to leave undisturbed those broods already banded when subsequent visits were made.

Summarizing the data obtained on brood sizes during the period 1929-1942, we find they were distributed as follows:

TABLE 1

	Viable Nestlings Per Brood						Totals		
First Broods	1	2	3	4	5	6	Broods	Nestlings	Average
No. of Broods	14	20	44	104	163	29	374		
No. of Nestlings	14	40	132	416	815	174		1,591	4.25
Second Broods									
No. of Broods	7	11	28	40	15	0	101		
No. of Nestlings	7	22	84	160	75	0		348	3.34
Total No. of Broods	21	31	72	144	178	29	475		
Total No. of Nestlings	21	62	216	576	890	174		1,939	Over-all Average 4.08

First nestings average 4.25 viable nestlings per brood. Second broods average 3.34. It is interesting to note that of the 1,591 first brood nestlings, 1,231 of them came from broods in the 4 and 5 categories. Forty-three per cent of the total of first broods contained 5 nestlings, while broods of 4 were 28% of the total. In second broods the 4 nestling category leads easily, being 40% of the total. Broods of six occur in greater proportion in some years than others. No second brood containing six was found. Bent (1942) states clutches of 7 eggs are rare, and Davis *(loc. cit.)* states he found one nest (out of about 400) containing seven nestlings. It would seem that in instances where more than 6 eggs or young are found, dual laying possibly occurred.

Infertile eggs and eggs with weak embryos were found during the course of this study. Occasionally complete clutches of infertile eggs would be found, the type and location of the nest indicating the possibility of immaturity in the nesting pair. Observations lead to the belief that older birds begin nesting activities with a greater sureness of purpose. Arriving at the chosen site, there is no hesitancy. They occupy the choicest sites, immediately refurbishing old nests in most cases, the complete cycle from nest building on being accomplished with a minimum of lost motion. Birds nesting for the first time, on the other

hand, have much to learn by experience. Failing to appropriate the most desirable nest sites, they are often forced to build completely new nests, the mating cycle in some instances probably being interfered with and its timing spoiled. Noting the distribution of nests in barns, it seems that sites receiving the most light are the preferred ones. The most intense light is usually near the places of ingress and exit, thus confusing the issue, but in one barn of considerable length the nests were located chiefly at both ends, at one of which there was no opening, but at which there was light coming in through a window.

All indications point to the facts that normally the Barn Swallow hatches a high percentage of eggs laid, and raises a large proportion of young hatched.

Due to several factors, it usually was found impossible to give as complete coverage to second broods as first. Therefore, the relationship between the figures for first and second broods in no way reflects the true ratio. A careful consideration of the records shows that only in the year 1938 was a degree of efficiency reached that makes the data on the ratio of second broods to first at all reliable. In that year 52 first broods and 35 second broods were banded, indicating that at least 67% of the total number of pairs present had second broods. This is believed to be a high ratio probably seldom exceeded. Bent *(loc. cit.)* refers to an observation made in New York State of a dozen nesting pairs, stating that almost exactly 50% raised a second brood. The same authority states the belief that pairs nesting in refurbished nests were the ones raising second broods. As will be shown later, nearly half of a breeding population would be over two years old, further confirmation of the fact that second broods are raised by the approximately 50% of the breeding population with previous nesting experience.

LIMITING EFFECTS OF WEATHER

On several occasions during the course of this study, the effects on Barn Swallow populations of extreme weather conditions were observed.

From time to time it was noticed that in some barns extremely high temperatures were built up during periods of hot weather. This condition was noticeable when carrying on the banding work near the peaks of the roofs. Also, there appeared to be a correlation between the high temperatures reached and the finding of dead nestlings beneath the nests.

Barn Swallows were purposely barred from nesting in the barn loft at the Wharton Station because no nestlings were raised there for several seasons. Reasons for the lack of nesting success were not clear at the time, but in the light of later experiences it seems quite likely that the high temperatures generated in the loft, due to the relatively modern (Mansard roof) type of construction, was the reason.

The possibility of parasitism by *Apaulina*, once known as *Protocalliphora*, was considered, but when note is taken of the fact that only two definite cases of parasitism of Barn Swallow nests by this fly came to light during a period of seven years during which 276 broods of this species were under study, it seems obvious that other factors were

the likely cause. Furthermore, in those instances when *Apaulina* larva were found in Barn Swallow nests, they were not considered present in lethal numbers (Mason 1942).

On several occasions it had been noted that the Horrax Barn in West Groton was the hottest one in which the banding work was carried on. Even so, the extremely high temperature found there on June 22, 1938 was an unusual experience. Also extremely unusual was the finding on that date of a total of 10 nestlings dead beneath the nests. Notes made at the time state "nests numbered 1 and 11 were responsible for most of the mortality." Lesser degrees of nestling mortality were found the same day in other barns. The total experience of dead young beneath the nests, and panting nestlings hanging their heads over the sides of nests in obvious discomfort, resulted in the opinion that the extremely high temperatures built up were responsible. It was noted that half-grown young were most affected. It should be repeated that high temperatures inducing nestling mortality are the result of a several-day-period of hot, clear weather, which builds up extremely high temperatures near the roof of the barn. The structure of the barn and its orientation are also factors, roof construction features of more modern barns being more likely than old ones to contribute to the building up of extreme temperatures.

The effects of a protracted rainy period were observed after a northeasterly storm which began on the afternoon of June 26, 1938, and ended during the night of June 28. The Station rain gage recorded a fall of 2.59 inches for the period.

Barn Swallow nests were visited on the 27th. While no dead nestlings were found, it was noted that the spark of life in some was so low that it was barely discernible. Nestlings were so cold and lifeless in many instances that the feeble turning of the head was the only indication of life.

The mean temperatures during this period are important. Although it was 64° on June 26, it dropped to 58° on the 27th. On the 28th and 29th, it was 63°. The average mean for the month of June at Groton is 68°. The minimum readings were 56° for June 26 and 27; 55° for the 28th; and 52° for the 29th.

The combination of low temperatures and continuing rainfall obviously must cause a lessened food supply for a species which garners its insect food entirely while on the wing. It thus happens that when nestlings require more food to combat lower temperatures, the available food supply is at low ebb.

Returning to a barn on July 2, 1938, where five nests containing 17 nestlings had been visited on June 27, it was found that only 6 of the 17 nestlings were still alive. Thus this nestling population had suffered a mortality rate of 64.7% during the period of low temperatures and continued rainfall.

Barn Swallow nestling mortality during this same period was reported from Harvard, Massachusetts, by James L. Peters. At Harvard the age of the birds was said to be up to practically fully fledged nestlings. The group of nestlings at Groton were not much more than half grown.

RETURNS

The bird banding literature contains many instances showing the greater proportion of returns that result from banding adults as compared to nestlings and juveniles. The same is true in this instance. Using the material gathered in the years 1933-41 we find 80% of the returns were adults when banded, while only 20% came from the much larger nestling group. During the period 381 adults were banded, 34% subsequently returning. Nestlings banded numbered 1,718, only about 2% subsequently being retaken as returns.

The sex ratios of these returning age groups are compiled in the following table. The years 1935-41 are used, prior years being discarded because of less efficient sex determinations.

TABLE 2

SEX RATIOS OF RETURNING AGE GROUPS

YEAR BANDED	BANDED AS		ALL AGE GROUPS			
	ADS.	NESTS.	MALE	FEMALE	SEX ?	TOTAL
	♂ : ♀	♂ : ♀				
1935	17:11	4:0	21	11	4	36
1936	4:5	4:0	8	5	1	14
1937	9:7	6:1	15	8	3	26
1938	11:13	—	11	13	1	25
1939	3:5	1:0	4	5	2	11
1940	7:10	—	7	10	—	17
1941	3:7	5:0	8	7	—	15
	54:58	20:1	74	59	11	144
SCALE OF 100	93:100	2,000:100	125:100			

Before discussing the astounding ratios unearthed by Table 2, the following table shows the sex ratios of breeding populations, including unbanded birds which arrived to nest as well as birds returning which had been banded in previous years either as adults or nestlings.

TABLE 3

SEX RATIOS OF BREEDING POPULATIONS
INCLUDING NEWLY BANDED ADULTS

	AGE								RATIO OF ♂ ♂ PER 100 ♀ ♀
	1*	2	3	4	5	6	7	8	
	♂ : ♀	♂ : ♀	♂ : ♀	♂ : ♀	♂ : ♀	♂ : ♀	♂ : ♀	♂ : ♀	
1935	33:24	1:3	2:0						133:100
1936	27:21	19:7	2:2	1:0					166:100
1937	38:23	4:3	6:5	0:3	2:0				147:100
1938	31:27	5:5	4:2	1:2	0:2	—			108:100
1939	21:21	15:12	7:5	1:0	1:0	—	—		115:100
1940	19:22	2:4	8:4	2:0	1:0	0:1	—	—	103:100
1941	11:16	7:8	2:3	3:2	3:0	0:0	0:1	—	87:100
1942	17:16	3:7	3:5	0:2	1:1	2:0	1:0	0:1	84:100
SCALE OF 100	116:100	114:100	131:100	88:100	200:100	200:100	100:100	0:100	117:100

*All newly banded adults were assumed to be one year old.

Any discrepancies between the figures in Tables 2 and 3, and those in Tables 4 and 5, are due to some birds being "Sex?".

The ratio of 117 males to 100 females for the entire breeding population as shown in Table 3 seems like a fairly normal relationship. It is perhaps significant that the 1 year group has about the same ratio; i.e., 116:100. As shown by Daley (1929) and Smith (1937), and borne out frequently by observations made during the course of this study, both parents normally spend the night in close proximity to the nest during the period when the young are in it. Thus if the night operation of catching adults is carried out without any great number escaping, a fair sample of the adult population can be expected to be taken. If it is assumed the males have a possibly slightly less attachment to the young than the females, if anything a preponderantly female ratio could even be expected.

The year by year variations in the ratios given under the heading "All Age Groups Present", given in Table 2, are puzzling in view of the above statements. However, a clue may be found in the fact that on occasions when an adult population has been caught twice in one year, once during the first brood period and once during the second, individuals have been taken during the second operation that were not present at the first one. Davis *(loc. cit.)* refers to this phenomenon. It is believed, however, that variables in the data due to this factor would tend to cancel each other out over the seven year period treated. It may be that a further clue is contained in the 2,000:100 ratio given in the same table for returns which were banded as nestlings. If a segment of the adult population is not tied by any bonds to a particular barn territory, might not this segment be composed of one-year-old unmated, unattached males? Even considering the ratio for the average adult population of 117:100, given in Table 3, we are confronted with a surplus of males, and it seems reasonable to suppose that this surplus would continue its efforts throughout the breeding season to find mates, and would constantly be on the move from barn to barn in its endeavors to find empty territories and unmated females.

It is astonishing that the 21 nestling returns (Table 2) give the ratio of 2,000:100. This ratio counterbalances the 93:100 ratio derived from the adult-when-banded group totaling 112 individuals. Considering the small percentage of birds banded as nestlings which return at all, the only inference possible, even after taking into account an expected heavy juvenile mortality, is that nestlings disperse widely to find nesting territories, but that nestling males return to the region of their birth more faithfully than females.

In Table 3 the downward trend in the numbers of females returning in age classes 3, 5, and 6, is striking, and their dominant position in age class 4 puzzling. It should be noted, however, that the figures for the years 5, 6, 7, and 8 are weighted by one female which ultimately returned for the seventh time when she was at least 8 years old. If it had not been for this lone record, there would be no females recorded as present in age classes 6, 7, and 8, and instead of the data showing

longevity as a female attribute, it would on the contrary indicate males in the ratio of 2 to 1 outliving females.

From the foregoing it can be inferred that the birds arrive on the nesting grounds mated, males bringing in new females in most instances. Females show up poorly in survival data, as indicated in Table 3, for two reasons: (1) Some are attracted to new territory; (2) some are more than 1 year old when appearing in records for the first time.

RECORD OF NESTING PAIR

The two Barn Swallows nesting at Five Oaks Farm, Groton, in 1943, were captured on the night of June 19. Because of the layout it was possible to enter before the birds were disturbed. When the lights were switched on, they were found sitting side by side on a cleat about six feet from the nest. Their young were quite large, and probably would leave the nest in about four days, which may be the reason neither adult roosted actually at the nest. Both birds were returns. The male, 37-95213, had been banded as an adult on July 1, 1937, and was therefore at least seven years old. The female, 140-49439, had been banded as an adult on July 3, 1940. In 1943 this pair was again occupying a nest they had used in 1940 and 1941, but which had been usurped by Phoebes *(Sayornis phoebe)* in 1942. The records show that the female was not caught in 1942, otherwise the pair of Barn Swallows using this location were known to be the same from 1940 to 1943, inclusive. The same pair were definitely mated, and used the same nest site for three of the four years. It should be pointed out that the location was so small that it offered only one nesting territory, although, as indicated, two Barn Swallow nests had been built at the location.

BREEDING POPULATION OF ONE BARN

The breeding population of an individual barn was measured on June 19, 1943. This was the colony at the Clough Barn, situated about 2 miles S.S.E. from Groton. This barn's colony of swallows, both adults and young, had been banded annually in the period 1934-1942. Only the adults were trapped in 1943. Based on plumage and the presence or absence of brood spots, the adult population was determined to fall into the following categories:

TABLE 5

	OLD MALE #	1 YR. MALE	ADULT MALE*	ADULT FEMALE	TOTALS MALE	TOTALS FEMALE
RETURNS	—	—	8	8	8	8
NEW	3	4	4	6	11	6
TOTALS	3	4	12	14	19	14
SCALE OF 100					135 :	100

#Two or more years old, based on plumage.
*No age determination possible.

The first thing of note is the even sex ratio among the returns. The preponderance of males in the totals (135:100) upset the picture of balance, but is offset by the 15:14 ratio obtained by totaling the adult males and old males, (i.e., ones believed to be over one year old), and comparing that figure to the number of adult females. This is 107:100, a ratio arrived at by leaving out the 4 birds classified as one-year-old males. This is another item of evidence pointing to the possible fact that one-year males may not always find mates.

AGE COMPOSITION OF BREEDING POPULATION

It was hoped it would be possible to show survival as indicated by returns, as was done by Wharton (1941) for wintering finches in South Carolina. A study of the data, however, indicated that in this case no satisfactory base was present to start from. With so few nestling females returning, and with annual turnovers in the adult female population, any attempt to show survival on the basis of returns alone was impossible.

The following table was compiled as a substitute. Showing as it does the known age groups present, it does give some idea of the survival of this species.

TABLE 4

AGE COMPOSITION OF BREEDING POPULATION*
(ASSUMING NEW BANDINGS TO BE 1 YEAR OLD)

	1	2	3	4	5	6	7	8	TOTAL TAKES
1933	18								18
1934	27	5							32
1935	62	4	2						68
1936	58	34	4	1					97
1937	62	9	12	3	2				88
1938	60	10	6	3	3				82
1939	44	29	12	1	2	—	—		88
1940	42	7	12	2	1	1	—	—	65
1941	27	15	5	5	3	0	1	—	56
1942	33	10	8	2	2	2	1	1	59
TOTAL RECORDS	433	123	61	17	13	3	2	1	653
AV.	43	14	8	2	2	1	½	0	65
SCALE OF 100	66	19	9	3	2	0.50	0.30	—	

*Going downward diagonally to the right in table 4 shows the survival of birds banded in a particular year.

From the data thus far presented, it is possible to construct a hypothetical barn swallow breeding population. This breeding population is composed of unbanded birds and returns. The unbanded birds have come to the colony from elsewhere. They have a sex ratio of 116:100, and include in their numbers, presumably, both one-year-old birds and older, the one-year-olds predominating. The return group, banded at

the colony in previous years, is composed of 20% one-year-olds, and 80% two years old or older. The 20% banded the previous year as nestlings has a sex ratio of 2,000:100. The remaining 80% has a sex ratio of 93:100.

Because the returns banded as nestlings come back to breed for the first time in the disproportionate sex ratio of 2,000:100, it might be expected that unbanded new arrivals would be preponderantly female. Such appears not to be the case, for we find a sex ratio of 116:100 in this group. Thus the facts all seem to point to the probability that the surplus of young males is not strictly speaking a part of the breeding population, either because they cannot find mates, or because in all instances they have not arrived at physiological maturity.

Combining all the data enables us to construct a barn swallow population from the time of its arrival in spring through the nesting season to its departure in fall. (Incidentally, through the kindness of Austen Fox Riggs, the outside dates of arrival and departure can be given for the Groton region. They are: arrival, April 17; departure, October 2. The arrival in force of the species occurs during the first week of May. Normally the exodus of the major portion of the breeding population occurs in late August.)

Arriving to nest in the spring would come 117 males to each 100 females. Of this breeding population 66% would be nesting for the first time, 19% would be 2 years old, 9% three, 3% four, and 2% five years old. There might or might not be a bird present which was 6, 7 or 8 years old.

This adult population would produce 100 first broods, including renestings, with a total of 425 viable nestlings. It would produce 50 second broods with a total of 172 nestlings.

Thus, by the end of the nesting season, the 217 adults are potentially augmented by 597 young birds, making a total population of 814.

Assuming the breeding population which arrived to nest the following year was exactly the same size, it would be 26.66% of the total reached, including reproduction, by the end of the previous nesting season. In terms of annual mortality suffered by a barn swallow population, we have the indicated figure of 73.44% per annum.

SUMMARY

The Wharton Bird Banding Station, Groton, Mass., banded 2,469 nestling and adult Barn Swallows in a 14 year period.

From records of 1,939 nestlings, it was learned that 374 first broods averaged 4.25 viable nestlings per brood, 101 second broods, 3.34. Of first broods, 43% contained 5 nestlings, 28%, 4. Four-nestling broods comprised 40% of second broods. About 50% of the breeding population raised second broods. Twenty-nine broods contained 6 nestlings. The species hatches a high percentage of eggs laid, and raises a large proportion of young hatched.

It was noted that extremes of both hot and cold weather had adverse effects upon the nestling population. A population of 17 nestlings in

one barn suffered a mortality rate of 64.7% during a cold, wet period.

Eighty per cent of the returns were adult when banded, 20% were nestlings.

From 381 adults banded, 34% returned with a sex ratio of 93:100. Only 2% of the nestlings banded returned, with a sex ratio of 2,000:100.

The entire adult population gave a sex ratio of 117:100.

An annual mortality of 73.44% is indicated for the species.

Three birds lived to at least 6 years, 2 to 7, and one to 8 years.

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Arcadia Wildlife Sanctuary, Northampton, Massachusetts.

HOME LIFE OF THE VEERY

KATHARINE C. DAY

From 1926 to 1932 I made a special study of the habits of the Veery *(Hylocichla fuscescens fuscescens)* observed nesting in Holderness, New Hampshire. The material in this article is based on the records of thirty-two nests.

Banding Record. During the past fifteen years I have banded one hundred and five fledglings and one adult. The adult was banded by placing two of its young in a chardonneret trap as decoys the day they left the nest. So far I have not had a record of a return Veery.

Location of Nests. A hillside of about three acres sloping gradually to Lake Asquam was the nesting area used each year by the Veeries. It was heavily wooded with deciduous trees, principally beeches, maples and oaks, with large pines occurring at intervals. Beneath the trees was a continuous growth of mountain laurel *(Kalmia latifolia)* averaging from eighteen inches to five or six feet in height.

Seven nests were built on the ground, one without any shelter, four between stems of moose maple saplings, and two protected by large ferns.

Three were built on stumps from eleven to twelve inches from the

ground, and one in the cleft of a dead tree forty-two inches from the ground.

Twenty nests were all built in mountain laurel, ten ranging from six to seventeen inches in height from the ground, and five others from twenty to twenty-nine inches.

Two nests were built in unusual locations, one in a juniper bush and one in a tangle of blackberry vines twenty-one inches from the ground and well protected by sheltering leaves.

Type of Nest. The loose structure of the nests gave them an exceedingly bulky appearance.

They were built of slender twigs interwoven with strips of dry shredded bark, and a great many dried beech leaves were used both inside and outside the nest.

In several instances where oak leaves were in abundance close by these leaves were used instead of beech.

The inner cups of the nests averaged one inch and a half in depth and two inches in diameter. They were lined with strips of bark, pine needles and fine rootlets.

Nest Construction. I found a half built Veery's nest on May twenty-ninth. It was completed on May thirty-first. I spent five hours watching its construction from a blind. The nest was built close to the ground between the stems of moosewood maple saplings, and well protected by sheltering green leaves. The outer structure was built of slender sticks, shredded bark, and large dried oak leaves.

At 10:38 A.M., May twenty-ninth, a Veery flew to the nest with an oak leaf in its beak, placed it inside the rim, then completely vanished inside the nest except for its tail which was pressed down like a lever as the shaping of the nest took place. This process was repeated over and over again as new materials were brought to the nest. The bird constantly shifted its position in the nest from north to east, then south and west, in order to shape it evenly. Oak leaves, strips of shredded bark, dried grasses and pine needles were used.

The Veery was evidently out of sight of the nest while selecting materials, as a Wood Pewee that was building its nest close by kept stealing choice bits out of the nest and was not caught once by the owner during the time I was in the blind.

Owing to the similarity in coloring of both sexes it was not possible to determine whether only one bird took part in the nest construction or whether they made alternate trips. At no time did I see two Veeries at the nest at the same time.

Incubation Period. The period of incubation varied from ten to twelve days including the day the clutch was completed. Twenty-four nests contained four eggs each, seven nests had three eggs, and two nests had five eggs.

Spent an hour and a half waiting for a Veery to lay an egg. She remained motionless, maintaining the same position on the nest, except for an occasional turning of her head. Fifteen minutes before she left the nest she humped her back and then raised her tail slightly. The instant she left I examined the nest. The newly laid egg still had a

couple of shining patches of moisture on it. There was no sign of the male in the vicinity of the nest.

I watched a female incubating her eggs for an hour. She did not change the position of her body at all. Six times she raised her head to identify unusual sounds—such as loud gusts of wind sweeping through the trees, or the sharp rustling of leaves. Half a dozen of her feathers were fluttering from the stem of the sapling touching the nest, as if she had recently defended her nest from an intruder.

Description of Nest. On June fifth, 1926, I found the partially built nest of a Veery. It was on the ground between the stems of some striped birch saplings, on the edge of a swampy piece of ground about forty feet from Lake Asquam, New Hampshire. At least a dozen stiff yellow straws and some small sticks were used in the framework of the nest. The straws were an unusual choice of material for a Veery and I had never found them in previous nests. The strongly built inner wall was made of long strips of bark and the nest was both lined and thatched with dried beech, oak and birch leaves. One fruiting stalk of Lycopodium ornamented the outer wall. On June sixth the nest seemed to be completed. The inside diameter was three and a half inches, the outside diameter five inches, the outside depth eight inches, and the inner depth one and one half inches.

The first egg was laid on June seventh and was so well covered by a dried leaf that I almost missed recording its arrival. The second egg was laid on June eighth, and the clutch of four eggs was completed on the tenth of June.

Mr. A. C. Bent, who was staying at Camp Paugus, very kindly loaned me a blind which was placed about fifteen feet from the nest. On June sixteenth he took some photographs of the female incubating the eggs, and on June twentieth I moved the blind to within ten feet of the nest.

Hatching of Young. From previous records of Veeries' nests I had found that the period of incubation occupied from ten to twelve days including the day the clutch was completed. Therefore on the twenty-first of June I flushed the female at 12 M. and examined the eggs. Two of them had commenced to pip and the third egg showed a series of small holes evenly drilled around half the circumference. New holes appeared as I held the egg in my hand, and the surface between them became cracked. I returned to the blind, taking the egg with me, and a few seconds later it began to split open. The crack widened rapidly. The fledgling rested between efforts, then seemed to push with both legs and wings. Soon I could see a portion of its back. The youngster was packed inside the egg with its head doubled under its body. It freed its legs first,—then rested, and with a last mighty effort got its head out of the shell which was still held together in the centre by a hinge-like section. The first thing it did was to lift its head and open its mouth wide. A few black wisps of natal down, still wet, were visible on the head and back. Exactly five minutes had elapsed from the time the egg began to split open until the fledgling was out of the shell.

At 12:15 P.M. I put the young bird back into the nest and returned to the blind intending to get the egg shells. At that moment the female

lit on the rim of the nest. She looked at the fledgling, passed her bill over it several times, and settled down on the nest. Left the blind without flushing her.

2:45 P.M. Returned to the blind. The female was off the nest and as I drew near both parents gave sharp alarm cries showing great anxiety for the hatching fledglings. The acute tone of distress was noticeably different from the low plaintive call which the female used during the incubation period upon the approach of danger.

2:50 P.M. Female lit on the rim of the nest and fed the young a small, smooth green caterpillar about half an inch in length. She settled herself on the nest.

2:55 P.M. Female left the nest with half an eggshell in her beak.

2:59 P.M. Female returned and fed small insects to young, then settled upon nest and brooded young until 3:42 P.M. when she left the nest. I hurried out and found three fledglings had hatched, and the fourth egg was not yet pipped. Placed the eggshells of the fledgling that had hatched in my hand in the nest, and got back into the blind without any alarm cries from the parents.

3:45 P.M. Female returned with a small green caterpillar, fed the young and broke the shreds of the shell which hinged the two halves of the eggshell together. She left the nest and carried one half away toward the lake in the opposite direction from the course taken at 2:55 P.M.

3:59 P.M. Female returned, seized the other eggshell and carried it toward the lake.

4:03 P.M. Female returned hopping along the ground in short dashes, fed the young a small insect and brooded them.

4:10 P.M. Female left nest at the same instant the male lit on the rim and fed the young. This was his first appearance at the nest while I was in the blind.

From 4:15 P.M. to 5:40 P.M. the female fed the young five times and the male twice. The female brooded the young four times between feedings.

By 5:40 P.M. the light was very dim and I was about to leave the blind when a small hawk flew swiftly past the blind. A moment later I glanced out of the front aperture and saw a Sharp-shinned Hawk light on the ground about three feet from the nest and advance toward it. The female reared up in the nest in a defensive position with outspread wings. Not risking another instant's delay, I plunged out from the front of the blind, shouting loudly and waving my arms. In so doing I tripped on the mosquito netting bag which enveloped me from head to foot, and had some difficulty in extracting myself from it. By the time I had gotten up both the hawk and the female Veery had disappeared and I did not know whether the hawk had caught the Veery while I was bursting out of the blind.

The three fledglings were unharmed and the fourth egg not yet pipped. I gathered up my belongings and left the blind in the deepening twilight with many doubts as to the fate of the female.

June 22nd, 10:30 A.M. Entered the blind and was cheered to hear a Veery calling close by.

10:35 A.M. There was a rustle of dry leaves and a Veery came hopping toward the nest. As this was the female's usual method of approach I watched eagerly. The parent fed the young some insects and brooded them.

10:40 A.M. The Veery left the nest and at the same instant the male lit on the rim and fed the young.

10:44 A.M. Examined nest. The last egg had not yet hatched.

10:55 A.M. It showered lightly and the female brooded the young. She disposed of the faeces of the fledglings by swallowing them. The male followed the same procedure.

Examined one of the day old fledglings. Its eyes were closed, the head covered with gray natal down which extended along the spinal tract.

Upon leaving the blind I found half an eggshell thirty yards from the nest on the ground.

On June 23d I spent one hour in the blind from 4:55 P.M. to 5:55 P.M. During that period the male fed the young five times and the female twice. She brooded the young three times between feedings. The fledglings were much stronger than on the previous day and raised their heads vigorously to be fed.

Food. The newly hatched young were fed spineless green caterpillars half an inch in length, small insects and soft white grubs for three or four days. The parents bruised the caterpillars and grubs before feeding them to the young for the first two days. From the fifth day until they left the nest they were fed quantities of dragonflies, larger insects, dark colored slugs, smooth green caterpillars and occasionally large Black Swallowtail butterflies.

Disposal of Faeces. The faeces were consistently swallowed by the parents until the young were six days old. After that they sometimes carried them away—but frequently swallowed them.

Watched a brood of nine-day-old young for two hours. The parents swallowed the faeces four times and carried them away seven.

Development of Fear. The eyes of the fledglings were partially open on the fifth day, but did not appear to focus well until the seventh day, when with care the young could still be handled and yet remain in the nest. By the eighth day their sense of fear was fully developed and if touched they were almost certain to leave the nest instantly.

The fledglings usually left the nest when ten or eleven days old—occasionally remaining until the twelfth day. During the last three days in the nest they were very alert and aware of all unusual sounds, such as a Kingfisher calling, the rustling of the wind in the trees, or a motor boat on the lake. If one of their parents gave an alarm call they froze instantly.

Actions of Young. During the last three days of nest life the fledglings were very active, jostling each other, climbing onto the rim of the nest, flexing and flapping their wings, preening their feathers and snapping at mosquitoes.

Activities of the Parents. The female was constantly occupied with ridding the nest of parasites. The male guarded the nesting area and on one occasion drove away a Red Squirrel, flying at it with great

fury. Chipmunks and birds were also chased away unceremoniously. The male shared equally with the female in the feeding of the young and the disposal of the faeces.

Signal Calls. The clear flowing beauty of the Veery's song defies adequate description. The usual sequence contained five double notes with special emphasis on the last single one:—"Hee-Hew—Hee-Hew—Hee-Hew—Hee-Hew—Hee-Hew—Hee!"

The Veeries also gave a plaintive alarm call:—"Whee-You-Whee-You," when the nest was approached or danger of any kind threatened its safety. During the incubation period the female gave this call in low tones, when alarmed. As soon as the young hatched these cries were given at a sharper pitch, denoting great distress by both parents.

The last two days before the young left the nest these alarm cries again showed heightened anxiety for the safety of the fledglings. The female was especially apprehensive. This "Whee-You" call was also alternated with a harsh rasping sound given by both parents when disturbed.

One pair of mated birds signalled to each other several times shortly after the young had hatched. The male lit in a sapling near the nest and gave a soft cheeping call. The female at once left the nest and the male flew in and fed the young. An hour later as the female brooded, she opened her beak wide and gave a curious dry squeak. The male came instantly to the nest and lit on the rim. Then they both left. The female returned to the nest three minutes later and brooded the young five minutes. She again made the thin squeaking sound six times in rapid succession. Her mate answered from a distance—but did not come to the nest.

After the fledglings' eyes opened on the fifth day they became more active. They sometimes chirped softly when their parents were absent from the nest or when fed. On the eighth or ninth day and until they left the nest they chippered loudly when fed.

Young Leaving the Nest.

4:20 A.M. Entered the blind without alarming the parents who were away from the nest. A foggy, dark morning. The ground nest was sheltered by laurel and the light very dim. The four young were in the nest and very active flexing their wings and preening. They were fed by both parents.

4:40 A.M. One parent approached hopping along the ground and fed the young. One fledgling perched on the rim of the nest flexing its wings. The parents fed the young at five minute intervals and carried away the faeces.

5:15 A.M. Parent fed young. One fledgling hopped awkwardly around half the circumference of the nest, then settled down. Because of the dark foggy morning there were no dragonflies or butterflies on the wing. Dark colored slugs were being fed to the young. The interval between feedings was longer because the food supply was not as abundant as usual.

The young were fed at 5:30 A.M., 5:35, 5:37, 5:45 and 5:50 A.M. At 5:50 A.M. the young were very active, climbing over each other,

preening their feathers, "cheeping" softly when alone—clamoring loudly when fed. They were now eleven days old. Two of them stood on the edge of the nest balancing clumsily and spreading their wings. The other two crowded each other in the nest. One of the parents was calling nearby.

6:05 A.M. One lively fledgling hopped onto a horizontal dead branch which touched the nest at one end and protruded fifteen inches beyond it. It balanced clumsily, hopped along the branch and fluttered down on to the ground. It then scrambled off through the dense laurel.

6:06 A.M. A second fledgling hopped along the same branch and fluttered from it six inches to the ground. One of the parents encouraged the first fledgling to follow it through the laurel. The other parent in a tree overhead watched the progress of the two young who continued scrambling along and "cheeping."

6:09 A.M. Both fledglings were twenty-five feet away from the nest in dense laurel.

6:15 A.M. The two remaining birds were quiet in the nest. The parents did not feed them.

6:20 A.M. One of the parents called from a distance of forty feet.

6:27 A.M. The young became impatient. They preened and moved about in the nest, cheeping occasionally and gaping.

6:40 A.M. One fledgling vibrated its wings, standing on the rim of the nest. One parent kept on calling.

6:48 A.M. One parent gave a sharp warning signal. The young flattened down in the nest motionless. A red squirrel ran by not far off.

6:50 A.M. The squirrel chattered angrily as one of the parents flew at it fiercely and drove it away.

7:05 A.M. The young cheeped hungrily. One parent sat in a tree overhead watching them, but did not feed them.

7:19 A.M. The fledglings called loudly.

7:20 A.M. One parent fed the young. A fledgling perched on the rim of the nest, then fluttered across the nest twice. It hopped onto the same branch used by the others and soon fluttered to the ground, then went off into the laurel.

7:24 A.M. The last bird stood on the rim of the nest, then hopped on to the ground from the other side of the nest nearest to my blind. The parent was close by watching it as it made its way through the laurel.

Several years elapsed before I was able to observe a brood of Veeries leave their nest under natural circumstances. Many times nests which I was watching were robbed and often I missed the exact moment when the young chose to leave the nest.

Great care was necessary in order to observe the undisturbed sequence of nest activities, as the Veeries were easily alarmed by any sound or motion inside the blind and also by my arrival or departure. It was a much more difficult undertaking than watching the nest cycle of the Black Throated Blue Warblers—therefore it gave me great satisfaction to finally complete my observations.

Grouse Hollow Farm, Route 3, Box 474, Eugene, Oregon

GENERAL NOTES

Reapplying bands.—The last sentence in Professor Shaub's article on removing overlapped bands (Bird-Banding **24**: 12, 1953) seems to call for a comment. The aluminum used for bands does not stand up under cold work, that is, it breaks when repeatedly bent at the same place without annealing. When the band is opened to place on the bird most of the bending is along a narrow zone opposite the free ends. This zone is bent a second time in closing the band. If the band is removed, reformed, opened and reapplied, at least two more bends are given the same narrow zone. By this time comparatively little wear or corrosion may cause the band to fall into two pieces. The band should not be reformed in the open position because when again closed the free ends will be directed slightly inward.

An actual test was made on a 1A band of the 50-series. Each opening and closing may be called a cycle. At the third cycle the lessened resistance to opening and closing could be felt but there was no visible change. After the sixth cycle notching of the edges of the band at the ends of the bending zone could be seen. The first visible cracking occurred in the eleventh cycle and at the end of the next cycle a crack extended more than half the height of the band. I would not recommend reusing a removed band.—Charles H. Blake, Massachusetts Institute of Technology, Cambridge, Mass.

Notes on the Rough-winged Swallow.—Working well toward the northern edge of the range of the Rough-winged Swallow, *Stelgidopteryx ruficollis serripennis*, I have not been able to band many. My experience may be worth describing because the species is not apparently entirely amenable to the methods of the Bank Swallow banders.

My pairs of Rough-wings use partly dug, abandoned holes of the Belted Kingfisher in a bank of fine sand. This bank contains enough sizable stones and roots so that the Kingfishers can rarely dig straight holes deep enough to suit them. The latter species has actually bred there but once in some ten years.

In 1947 the swallows used a hole about 20 inches deep but since then have used a hole a few feet further north which is about 28 inches deep. I have never been able to take a male but have taken the female each year from 1947 to 1952 except 1950. Each time she has been a new, unbanded bird. Some peculiarities of behavior led me to believe that the same male was present from 1947 to 1949.

The nest material, which seems to be used year after year, is a slightly concave pad of straw, rootlets, and plant fibres.

The methods which I have used to secure females and young are simple, almost primitive, but seem generally satisfactory. The females have been caught by holding a wire mesh gathering cage about 12 inches long against the mouth of the burrow and then disturbing the bird with a flashlight beam. Only once have I had to stir her up by reaching a hand into the burrow, but she may refuse to emerge for some few minutes. The female is less likely to fly out when the burrow is approached if the attempt is made in the evening about an hour before dark. The bander must be prepared for a surprise when his first female comes out. She comes with a rush that carries her clear to the end of the gathering cage since she leaves the mouth of the burrow on the dead run.

The young should be left undisturbed until they are well feathered out and able to walk. They may then be brought out one at a time by inserting the hand palm down and caging the nestling between the fingers. If the hand is withdrawn slowly the young one will walk to the mouth of the burrow where it is readily secured. All are removed before banding is begun. As each is banded it is placed just inside the burrow mouth and prodded gently. It will walk to the nest on its own or even run if old enough.

I have not succeeded yet in capturing any adult males. Observations after dark suggest that the male does not roost in the burrow even after the eggs have hatched and that his visits to feed the young are very brief. My nest holes are badly sited for a quick jump to plug them.

What observations I have been able to make indicate that the fledglings do not return to the burrow after they have once flown from it.

In spite of the small number of nestings observed, it may be well to give my statistics on success. Five nestings have been observed and four of these to fledging. The probabilities, following Davis (1952), are: for hatching 0.75, for fledging from eggs 0.68 and for fledging from nestlings 1.00. The other probabilities seem to have little significance for so small a sample. There is another point to be made. Davis follows the usually accepted custom for computing such probabilities. The custom ignores the possibility that clutch size may be a factor in survival. The results may be weighted for the frequency of clutch sizes and the consequences of varying size by computing the probabilities for each clutch and then averaging. If this is done we find: for hatching 0.73, for fledging from eggs 0.66 and for fledging from nestlings 1.00.

It is not strange that the two methods should, in this case, yield almost the same results. The number of eggs laid is 5 or 6 with an average of 5.6 per clutch. The average number of nestlings is 4.2, or taking only the nests in which some eggs hatched, is 5.2. The difference in the last two figures comes from the desertion, in 1948, of 5 eggs before hatching.

I have elsewhere, as cited below, discussed the notes of young and adults and the flight of this species.

The general level of nesting success would seem to point to the conclusion that the scarcity of Rough-winged Swallows north of extreme southern New England is a phenomenon of the adults and does not stem from any difficulty of raising the young. This matter would repay examination elsewhere in the northeast.

References

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1948 The flight of swallows. *Auk*, **65:** 54-62.
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1952 Definitions for the analysis of survival of nestlings. *Auk*, **69:** 316-320.

Charles H. Blake, Massachusetts Institute of Technology, Cambridge, Massachusetts

The Rough-winged Swallow at South Windsor, Conn.—Dr. Blake's note (above) has prompted me to set down brief comments on the nesting of this species at the edge of the Connecticut River in South Windsor, Conn. My only definite record was in 1948, in the middle of the large Bank Swallow colony (see *Bird-Banding*, **22:** 54-63, April, 1951), though no intensive search has been made for this species. The hole was apparently excavated by the birds themselves, being somewhat larger than the Bank Swallow holes, but much smaller than the Belted Kingfisher holes. At South Windsor at least two pairs of Kingfishers nest annually in the Bank Swallow colony, but make no incomplete burrows (as there are no stones in the soil) and the river generally washes away each season's holes in the course of the following winter. Like the Bank Swallows, the Roughwings dug a hole too deep for the nest to be reached without enlarging the hole. Adult 47-19563 was banded on June 6, 1948 and retaken on June 26 in the same burrow; in neither case was the other adult present, contrary to general expectation in the Bank Swallows. In each case the bird was taken with a cardboard tube and cellophane bag; one fledgling of flying age (47-19846) was taken in the same way in the burrow on July 10, at which time there were three more young in the nest, feathered but not quite ready to fly out, while two adults flew about nearby. The fledgling resembled the fledgling Bank Swallows in having conspicuous cinnamon feather edgings, but these were noticeably more prominent, particularly on the shoulders.—E. Alexander Bergstrom, 37 Old Brook Road, West Hartford 7, Conn.

Evening Grosbeak Banded in Connecticut, Recovered in Manitoba.—In March and April, 1950, we banded 110 Evening Grosbeaks *(Hesperiphona vespertina)* at our previous station at 233 Ridgewood Road, West Hartford, Conn. This number was trifling compared to the totals at some other stations in the northeast, such as that of Mr. G. H. Parks in Hartford, where 1286 were banded that winter *(Bird-Banding*, **23:** 145). However, from that group of 110 grosbeaks we have by chance obtained a recovery which represents, as nearly as can be

determined from the Patuxent files, (1) the greatest known distance between point of recovery and point of banding for the species—about 1525 miles; (2) the farthest west recovery for any grosbeak banded in the northeast—compared to recoveries in Wisconsin and Ontario; and (3) the second or third farthest north recovery of the species in Manitoba.

This female Evening Grosbeak, 50-100794, was banded on March 22, 1950. It was found dead, partly devoured by a cat, at The Pas, Churchill District, Manitoba, on April 14, 1952, by Mr. Sam Waller, a teacher at the Indian School there. The band was submitted and verified at the time the recovery was reported by Mr. W. Winston Mair. This area is about three hundred miles north-northwest of the area around Winnipeg where most previous Manitoba grosbeak recoveries had been reported (including a number from the big Magee station at Sault Ste. Marie, Mich. The only Manitoba recovery definitely known to be north of The Pas was banded by Mr. Magee: 38-222121, banded April 2, 1938 and found February 27, 1939 at Moose Lake, some 50 miles northeast of The Pas.

When a detailed study of the Evening Grosbeak is made, it may prove to be significant that a number of the most distant recoveries are of birds banded in the northeast in 1949-50, and found in the provinces of Ontario and Manitoba, or in Wisconsin, thereafter. Since the 1949-50 flight in the northeast was very large, and the 1950-51 flight quite small, it may be that a sizeable proportion of the flocks which wintered here in the earlier season migrated far to the westward that summer. On the other hand, it is conceivable that the magnitude of the 1949-50 flight was due to sizeable numbers of birds from the western part of the breeding range, which merely returned westward. Despite the extensive banding of the species, its movements are still not an open book.—E. Alexander Bergstrom, 37 Old Brook Road, West Hartford 7, Conn.

A winter recovery of a banded Killdeer.—On May 9, 1950, at the University Botanical Gardens in Ann Arbor, Michigan, I color-banded three Killdeers *(Charadrius vociferus)*. These birds had hatched between 9:20 a.m. and 5:00 p.m. that day. I had checked this nest twice daily since finding it on May 5. The first time that I heard the young "peeping" inside the shell was at 6:35 p.m. on May 7; a fourth egg did not hatch.

On January 11, 1951, Mrs. Elsie Vinson of Brewster, Florida, found one of the banded birds (Red above 48-204992) with a broken wing eight miles southwest of Brewster, Polk County, Florida. Mrs. Vinson wrote to me that she had placed "a makeshift splint" on the bird's wing, but that the bird later escaped from the box in which it was placed. She further stated that "several weeks later" one of her children saw the banded bird with a small group of Killdeer, and that it was able to fly. The banded bird was not seen after that.—Andrew J. Berger, Department of Anatomy, University of Michigan Medical School, Ann Arbor, Michigan.

Electrocution of a Baltimore Oriole.—Birds commonly perch on bare electric wires without harm because they are not grounded and they have very little capacitance. On rare occasions, however, accidents occur which destroy birds by electrocution. A specific case was called to attention when a student, Walter Keller, found a dead male Baltimore Oriole *(Icterus galbula)* on May 12, 1948, on the street adjacent to our campus. The feet and lower portion of the tarsi had been completely burned off and the bill and forehead bore a deeply grooved burn. The specimen had a strong odor of burned horn. Apparently it had perched on one wire and touched another one, or possibly a wet branch of a tree, with its bill thus short-circuiting the electric current which destroyed the bird.—Ralph W. Dexter, Department of Biology, Kent State University, Kent, Ohio.

Longevity Record for Chimney Swift *(Chaetura pelagica)*.—On September 21, 1952, I trapped the chimney swifts roosting in a sixty-three foot, free standing chimney of the Junior High School, 307 Third Avenue, Rome, Floyd County, Georgia. 6,985 birds were recovered from this chimney of which 21 were found to be already carrying bands. One of the 21 foreign re-traps, Band No. 38-87838, was originally banded at Queen's University, Kingston, Kingston City,

Ontario, Canada, on May 19, 1940, by R. W. Smith. As the bird was banded in May it must have been of at least 1939 hatch. This would set the bird's age at 13 years. The Banding Office, at Laurel, Maryland, advises that the above constitutes the oldest chimney swift in their records. The band, on this swift, was found to be badly worn in one spot and was removed and replaced by Band No. 52-72499. The remaining 6,964 chimney swifts were banded and released. I believe that this is the largest number of chimney swifts to be banded from a single chimney in a single day.—Gordon L. Hight, Jr., 16 Notasulga Drive, Rome, Georgia.

An Unusual Accident to a Bronzed Grackle.—On May 20, 1948, we caught in a drop-trap a Bronzed Grackle *(Quiscalus quiscula aeneus)* which had suffered a rather strange accident. The hallux of the right foot was elevated so that it lay parallel to the tarsus, and the nail was firmly hooked around the tarsus so that it almost encircled it. When we released the toe, we found the tarsus scarred from rubbing, and the nail of the hallux was approximately 4 mm. longer than that of the left foot. The nails of the other three toes on this foot were found to be about 2 mm. longer than the corresponding nails of the other foot, and it was evident that the bird was unable to use the right foot in a normal fashion. Had we not trapped the bird at this time and released the toe, undoubtedly the nail eventually would have encircled the tarsus completely.

The bird, a female, was banded on the left leg with number 46-306903 and released.—Sally F. Hoyt (from the notes of Southgate Y. Hoyt), "Aviana," Etna, New York.

Screech Owl and banded birds.—Referring to the note by Andrew J. Berger in *Bird-Banding* (January, 1953, **24:** 19), recorded recovery of bands in owl pellets may throw interesting light on different owls as predators, and enemies of various birds. Where the House or English Sparrow *(Passer domesticus)* is abundant, the Screech Owl *(Otus asio)* likely takes a good many. House Sparrows are not generally banded, but at one time I was interested in problems relating thereto, and banded a considerable number at Garden City, Long Island, New York.

A male House Sparrow (No. 51464) was banded on January 26, 1930, its band recovered on May 28, 1931, from a disintegrated owl pellet under an evergreen tree a scant half mile from the banding station. Though proof is lacking, the evidence left no reasonable doubt that this was a Screech Owl pellet.—J. T. Nichols, The American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.

Band Recovered in Pigeon Hawk's Gizzard.—On May 7, 1952, I dissected an adult female Pigeon Hawk *(Falco columbarius)*. The bird had been shot by a neighbor at Chadwick's Pond, Bradford, Essex County, Massachusetts. In the gizzard of the falcon, attached to a bird's leg, I found a Fish & Wildlife band No. 50-119757. I had previously placed this band on a female Brown-headed Cowbird *(Molothrus ater)* on April 18, 1952, at my banding station at Brooks School, about three miles from where the Pigeon Hawk was killed.—Oscar M. Root, Brooks School, North Andover, Massachusetts.

RECENT LITERATURE

BANDING

(See also Number 65)

1. Bird Banding in Greenland in 1949 under the guidance of Finn Salomonsen, Ph.D. (Ringmaerkning af fugle i Grønland 1949 under ledelse af dr. phil. Finn Salomonsen.) 1950. Beretninger vedrørende Grønlands Styrelse, **1:** 81-85. From 1946 through 1949 operators in Greenland banded 11,919 birds of 39 species, from which 931 returns and recoveries had been reported at the time of writing. The totals banded and the numbers reported both in Greenland and elsewhere are listed for each species.—O. L. Austin, Jr.

2. Fourth Preliminary List of Recoveries of Birds Ringed in Greenland. (Fjerde foreløbige liste over genfundne grølandske ringfugle.) 1950. Dansk Orn. For. Tids., **44**(3): 168-172. (English summary.) "Previous lists of recoveries abroad of birds ringed in Greenland have been published in D.O.F.T. 41, 1947, p. 141; 42, 1949, p. 100 and 43, 1949, p. 251." Of particular interest are the large numbers of White-fronted Geese recovered in the British Isles almost all of them in Ireland. Details are also given of recoveries of Murres, Kittiwakes, a Fulmar, and a Snow Bunting in Labrador and Newfoundland.—O. L. Austin, Jr.

3. Fifth Preliminary List of Recoveries of Birds Ringed in Greenland. (Femte foreløbige liste over gefundne grønlandske ringfugle.) 1952. Dansk Orn. For. Tids., **46**(3): 110-117. (English summary.) The young Arctic Tern I banded in Labrador in July 1928 and which was picked up 90 days and 9900 miles later in Natal no longer holds the long-distance flight record for a banded bird. This list contains the record of another Arctic Tern banded at Christianshaab, Greenland, July 8, 1951, and found dead October 30, 1951, at Durban, Natal. Not satisfied with starting some 1100 miles farther north than my Labrador tern, this bird went some 75 miles farther northeast after rounding the Cape of Good Hope. Its flight of about 11,200 miles is not likely to be surpassed for some time, though the species breeds still farther north, and has been collected even farther south.

Another significant recovery is a Red-throated Loon banded in Upernavik August 12, 1951, and shot at Kristiansund, Norway, October 30, 1951. Its long eastward flight suggests a probable constant intermingling of the population of this species in its breeding grounds around the pole, which would explain why no subspecific differences can be found between the Palearctic and Nearctic stocks.

Four more Snow Bunting recoveries confirm the migration of this species from Greenland southward along the Labrador coast, and westward and southward along the St. Lawrence. Additional recoveries in Newfoundland waters of Murres, Razor-billed Auks, and Kittiwakes show these species follow the Labrador Current southward.—O. L. Austin, Jr.

4. A Trap and Technique for the Capture of Diving Waterfowl.—I. McT. Cowan and James Hatter. 1952. *Journal of Wildlife Management*, **16**(4): 438-441. A simple and effective trap is described and illustrated, and trap placement and technique for driving different kinds of diving ducks are discussed. Using the methods described, almost 5,000 Barrow's Goldeneye, *Bucephala islandica;* 700 Bufflehead, *Bucephala albeola;* 1,700 Lesser Scaup, *Nyroca affinis*, and smaller numbers of the scarcer and more elusive ducks were banded.—Helmut K. Buechner.

MIGRATION

(See also Numbers 2, 3, 12, 14, 27, 62)

5. A Trans-Gulf Migration. H. R. Bullis, Jr., and F. C. Lincoln. 1952. *The Auk*, **69**(1): 35-39. This flight was observed mainly during the night of April 6, 1951, from a boat about 60 miles off the Louisiana coast in the Gulf of Mexico; a slowly falling barometer, low overcast, and fluctuating wind velocity and direction summarize weather conditions. During the night tens of thousands of birds passed the boat, flying N.N.W. and very low (under the overcast). Twenty-one species, mostly passerines, were identified and many more probably were present. Considering the direction of flight, evidently the birds left land at the northeast coast of the Yucatán Peninsula and would arrive on the coast of Louisiana. Weather conditions were not unusual. It is the opinion of the authors that the trans-Gulf route is used regularly.—Ralph S. Palmer.

6. Birds on the Gulf of Mexico. George G. Williams. 1952. *The Auk*, **69**(4): 428-432. The author presents some pertinent criticisms of the paper by Bulllis and Lincoln, 1952, A trans-Gulf migration, *The Auk*, **69**: 35-39, and appears to be inclined toward the view that the Gulf is not a true spring route, but instead that "spring migrants may be forced southward over the Gulf of Mexico

by bad weather coming from the continental United States" (p. 431). Certainly this must be only a partial answer. The reviewer believes that, when we have adequate data for individual species, the existence of regular spring trans-Gulf (and for many species also circum-Gulf, or circum-Gulf only) routes will be firmly established.—Ralph S. Palmer.

7. Fall Migration of Birds at Chicago. Holly Reed Bennett. 1952. *The Wilson Bulletin*, **64**(4): 197-220. A study of the fall migration of land birds was made by taking a daily census on a 1¾ mile route in Lincoln Park, Chicago, near Lake Michigan, from August 1 to November 30 of 1946 to 1950. The largest numbers (waves) of migrants were observed on the first two days following the passages of cold fronts over the Chicago area. Marked concentrations of birds migrate southeastward with NW winds after a cold front along the west side of Lake Michigan, with the lake acting as a barrier. Cold fronts followed only by strong NE winds never brought migration waves to Lincoln Park and the study produced no evidence that land birds migrate westward across Lake Michigan in appreciable numbers. The favorable N or NW winds which followed cold fronts were considered more important in causing migration waves than the coincident drop in temperature. Many of the early migrants, principally warblers (Parulidae), passed before the strong cyclonic circulation of autumn was well established, generally about mid-September. However, when early cold fronts did occur in late August and early September, they were always followed by important warbler migration waves. Many problems peculiar to the appearance of migrants in the Lincoln Park area are discussed and explanations are well supported (considering the limited area from which census data were obtained) by the eleven tables. Even though this is a regional study, the complete absence of reference to the contributions made by European investigators is regretable. The relation of both spring and fall migration to weather phenomena, including wind direction and cyclonic circulation, and to large bodies of water, has received much more attention in Europe than in North America.—L. R. Mewaldt.

8. The Source of Migrant Mourning Doves in Southern Florida. John W. Aldrich. 1952. *Journal of Wildlife Management*, **16**(4): 447-456. The hypothesis that early fall flights of Mourning Dove, *Zenaidura macroura*, in southern Florida originate in the West Indies is exploded by evidence gathered from (1) 299 specimens in hunters' bags during the October, 1950, hunting season identified as to race and (2) 168 band recoveries from Doves banded on Key West. Most of the Doves shot in southern Florida come from an extensive breeding area east of the Mississippi River. Doves harvested during the early part of the season consisted largely of rather sedentary local populations. Upon reaching the southern tip of the peninsula, Doves that migrate into Florida cease their southward progress and move north along the east coast to the latitude of Lake Okeechobee; thence they appear to cross the peninsula and migrate north along the west side, spreading into northern Florida and southern Georgia.—Helmut K. Buechner.

LONGEVITY

(See also Number 63)

9. List of Birds of Prey Ringed in Germany and Taken in Italy and Notes on the Longevity of Some of Them. (Elenco di rapaci inanellati in Germania e ripresi in Italia ed annotazioni sulla durata dell'inanellemento di alcuni di essi.) Edgardo Moltoni. 1952. *Rivista Italiana di Ornitologia*, **22**(ser. II): 77-78. Figures are given on five species of hawks that survived a decade or more after being banded: Hen Harrier, *Circus cyaneus*, 11 years; Marsh Harrier, *Circus aeruginosus*, 9, 11, 13 years; Red Kite, *Milvus milvus*, 11 years; Black Kite, *Milvus migrans*, 10 years; Osprey, *Pandion haliaetus*, 11 years.—M. M. Nice.

FOOD HABITS

(See also Numbers 17, 38, 53)

10. The Economic Status of the Herring Gulls of the Grand Manan Archipelago, New Brunswick, 1949. D. H. Pimlott. 1952. Canadian Wildlife Service, Ottawa; Wildlife Management Bulletin, Ser. 2(5): 1-76, 6 figs., 1 map. (Multilithed.) This summarizes the results of an investigation made by the author between May 26 and September 4, 1949, to determine the economic status of the Herring Gull, *Larus argentatus*, in the Grand Manan archipelago, New Brunswick. A short history of the colonies is given and the 1949 population is estimated at 50,000. Reproductive data for Kent and Outer Wood Islands were, respectively: estimated mean clutch size, 2.5 and 2.0; hatching success, 71 and 55-66 per cent; average survival of young per nest at 30 days, 1.06 and .82. A list of foods and a few observations on feeding behavior are given. Herring appeared to be the staple food and their availability governed the utilization of other foods. The local economic status is discussed in some detail (pp. 35-74).—W. Earl Godfrey.

11. Food Habits of the Golden Eagle. Wesley Woodgerd. 1952. *Journal of Wildlife Management*, **16**(4): 457-459. In an analysis of the contents of 51 stomachs of the Golden Eagle, *Aquila chrysaetos*, three contained pronghorn antelope only and five contained pronghorn in addition to remains of other mammals. This represented 16 per cent of the stomachs, far less than anticipated from reports of heavy predation on the pronghorn which culminated in an eagle-reduction program.—Helmut K. Buechner.

PHYSIOLOGY

(See also Numbers 33, 42, 60)

12. On the Dependence of Standard Metabolism upon Environmental Temperature in the Yellow Bunting *(Emberiza citrinella* L.), and Ortolan Bunting *(E. hortulana* L.). Henrik Wallgren. 1952. *Ornis Fennica*, **29**(2): 44-48. In order to find a possible basis for some of the factors regulating migration the author undertook investigations on certain aspects of the physiology of metabolism of the Yellow and Ortolan buntings. The latter is a typical migrant whereas the former is sedentary or, at most, a partial migrant. The results of the experiments indicate that the Yellow Bunting can tolerate temperatures down to —36°C. which is 20° below the limit of tolerance of the Ortolan Bunting. On the other hand the upper limit of tolerance of the Ortolan Bunting is 6° higher than that of the Yellow Bunting. This is explained by the greater plumage thickness of the Yellow Bunting whose metabolic rate in environmental temperatures lower than 28° is always lower than that of the Ortolan Bunting. The zone of thermoneutrality, *i.e.* the environmental temperature range in which metabolic rate does not change with change in environmental temperature, is 25-32°C. in the Ortolan Bunting and 32-38°C. in the Yellow Bunting. It seems very reasonable to assume that the development of a migratory behavior on the part of the Yellow Bunting would have only limited value in terms of enhanced survival since it is able to tolerate winter conditions through most of its range. On the other hand the development of migration in the Ortolan Bunting may have been necessary because of the species' physiologic inability to tolerate winter temperature conditions in the breeding range.—D. S. Farner.

13. Cyclic Changes in Liver and Spleen Weights in Migratory White-crowned Sparrows. Barbara Blanchard Oakeson. 1953. *The Condor*, **55**(1): 3-16. An analysis of liver and spleen fresh weights was made from 191 White-crowned Sparrows, *Zonotrichia leucophrys gambelii*, collected at dawn at Santa Barbara, California (lat. 34° 30′ N.) from January to April of 1949 and 1951, and from September to April of the 1949-50 season. Seventeen specimens were collected in May, June, and July of 1950 at Mountain Village, Alaska (lat. 62° 07′ N.). Santa Barbara is in the winter range and Mountain Village in the breeding range of the subspecies. Birds were obtained at Santa Barbara by

trapping (method of killing was not stated), whereas, Alaskan birds were shot. The sample taken included approximately twice as many males as females.

Monthly means of liver weights of males increased from November through April. The mean liver weight of "fat" April males (12) "ready to migrate" was 30 per cent higher than the mean for November males (10). The mean of liver weights of May males (8) from Alaska was about 31 per cent lower than for the "fat" April males which were "ready to migrate." Liver weights in proportion to body weights showed a similar trend, although changes were less pronounced in magnitude. The more variable spleen weights roughly paralleled liver weights. Weights of livers and spleens from females followed patterns similar to those in males. These data seem to provide justification for investigations on the nature of these changes in organ weights (e.g. possible differences in stored metabolites and vascularity) and on the mechanisms which produce them.—L. R. Mewaldt.

PSYCHOLOGY

(See also Numbers 22, 23, 24, 30, 32)

14. Essay on the Origin of Migratory Aggregations. (Essai sur l'Origine des Communautes Migratrices.) R. Verheyen. 1952. *Le Gerfaut*, **42**(4): 328-337 (with Flemish summary). The author proposes the rather tenuous hypothesis that the communal migration of several species together is facilitated by an instinctive reflex, well developed in higher vertebrates, to follow any moving object with the eyes, and by an involuntary tendency ("tropism") to follow one another, also observed frequently in the higher groups and, among birds, particularly noticeable in the waterfowl. He seems to postulate a sort of chain-reaction, starting with a bird or birds on the ground watching another or other birds in flight, and ending with a concerted mass movement. The theory, while interesting, involves the use of a series of non-sequiturs.—O. L. Austin, Jr.

15. Comparative Psychology. E. H. Hess. 1953. *Annual Review of Psychology*, **4**: 239-254. An expert review of books and papers on animal psychology from May 1951 to May 1952; 71 studies on birds, mammals and insects are described under Orientation, Instinctive Behavior, Learning, and Social Behavior. The author hopes that under the stimulus of "current European work . . . comparative psychology will again take its rightful place as one of the foundations on which most psychologies need to be built."—M. M. Nice.

NESTING

(See also Numbers 10, 21, 25, 28, 31, 32, 35, 36, 60, 63)

16. Observations on Duck Hawks Nesting on Man-made Structures. H. Groskin. 1952. *The Auk*, **69**(3): 246-253. Up to 1949 there were six records of *Falco peregrinus anatum* Bonaparte nesting on man-made structures in North America east of the Rockies. They are listed. Details are given of the sixth, on the city hall tower in Philadelphia in 1949. March 21: 3 eggs; April 19: 2 had hatched; April 21: 1 live and 1 dead chick, 1 egg that did not hatch. On June 23 the young (aged 66 days), perhaps in attempting flight, dropped into an enclosure. It was removed and kept captive until, on June 28 (aged 71 days), it flew well when given its freedom.—Ralph S. Palmer.

17. Observations on the Breeding of the South African Hoopoe. J. M. Winterbottom. 1952. *The Ostrich* **23**(2): 82-84. The author studied the nest of a hoopoe, *Upupa epops*, located under the floor of a cottage near Cape Town, and accessible through a small hole in the building wall. Food brought to the nest was mainly grubs, supplemented by grasshoppers, and (by the male only) by frogs and small snakes. The male did not enter the nest hole, but called the female or young to the entrance. The male fed the brooding female several times per hour; the young were fed about four times per hour. The feeding rates were irregular, and less than some other observers have reported. The male did somewhat more of the feeding than the female, particularly at first.—Hustace H. Poor.

18. Some Observations on the Breeding of the Crowned Plover, *Stephanibyx coronatus*, Bodd. T. C. L. Symmes. 1952. *The Ostrich* **23**(2): 85-87. The nest of a Crowned Plover containing three eggs was studied for six weeks near Johannesburg. The incubation period could not be determined, but probably exceeded 26 days. Adults of both sexes made diving attacks on the observers, and engaged in distraction display. The eggs and chicks are described.—Hustace H. Poor.

19. Extra-parental Cooperation in the Nesting of Chimney Swifts. Ralph W. Dexter. 1952. *The Wilson Bulletin*, **64**(3): 133-139. From 1944 to 1951, a banding and life history study of a breeding colony of Chimney Swifts, *Chaetura pelagica*, was made on the campus of Kent State University in northeastern Ohio. This interesting paper deals specifically with the 22 "threesomes" and six "foursomes" observed in a little more than one hundred nestings, where combinations of three and four adult birds apparently assisted with incubation of the eggs and care of the young in single nests. Of 40 individuals which participated in threesomes, 12 were involved more than once. Of 18 participating in foursomes, five were involved more than once. Nine birds were in a threesome and a foursome at one time or another. Twelve threesomes had an extra male and five an extra female. Three foursomes had two extra males and three others had an extra male plus a bird of unknown sex. Some of the extra birds were known to be birds in their first year (these swifts can breed in their first year) and some were old birds, but many were intermediate in age and engaged in active reproduction in later years. The possibility that trapping, incident to banding, may have reduced the numbers of threesomes and foursomes is discussed.—L. R. Mewaldt.

20. The Storks of Alsace. Results of Censuses for the Years 1950 and 1951. (Les Cigognes en Alsace. Resultats des recensements des annees 1950 et 1951.) A. Schierer. 1952. *Alauda*, **20**(3): 129-143. The results of observations on the breeding populations of Storks, *Ciconia ciconia* in Alsace for 1950 and 1951 are presented. Mean arrival time at nest sites was about three days earlier (March 18) in 1951 than in 1950, with each member of the pair arriving separately at about 75 per cent of the nests. In 1951, of 190 nests, 118 were on public buildings, 66 on private buildings, and 6 on trees. Whereas in 1950, 29 of 103 pairs failed to reproduce, only 6 of 113 pairs failed to nest in 1951. In 1950, of 226 young hatched, 211 left in the fall migration, and in 1951, 331 of 351 young hatched left in the fall migration. Numbers of young varied from one to five per nest in the two years, with three being the most common number. Although the total number of young produced in 1951 was greater than in 1950, it was substantially below numbers produced in 1947 and 1948. Departure on fall migration in both 1950 and 1951 was considered normal with the peak of departures in mid-August.—L. R. Mewaldt.

LIFE HISTORY

21. Field Sparrow Life History in Central Iowa. Malcolm P. Crooks and George O. Hendrickson. 1953. *Iowa Bird Life*, **23**(1): 10-13. Statistics on a *Spizella pusilla* population studied in 1947 on a 31 acre tract of idle pasture. From 45 eggs laid in 17 nests 16 young were fledged, 35.6 per cent of success. Of 29 Cowbird, *Molothrus ater*, eggs only two young were fledged, or 7 per cent. The paper summarizes a vast amount of life history information; it is to be hoped the results will be published more fully.—M. M. Nice.

BEHAVIOR

(See also Numbers 14, 15, 19, 43, 54, 63)

22. The Development of Social Behavior in Birds. N. E. Collias. 1952. *The Auk*, **69**(2): 127-159. "The purpose of this brief survey is to illustrate by means of selected examples the manner of operation of factors that control development of social bonds in birds" (p. 127). The examples, for which simple terminology is employed, are the result of observations or experiments, often lucidly illustrated, and written up with an eye on pertinent literature. An inter-

esting suggestion is that a difference in time relations "in pituitary-gonadal development may prove to be one characteristic difference between nidicolous and nidifugous species of birds" (p. 143). In two species of Columbidae (nidicolous) the testes do not grow appreciably until two or more months after hatching; in male domestic fowl chicks (nidifugous), growth and secretion of the testis begin within a week and testis weight has increased some 80 times by the age of 90 days.

From the conclusions: "The basis for social reactions is largely developed by the embryo before hatching takes place. The trends in socialization of the young bird after hatching may be summarized as follows: (1) a period of relative inactivity, and sometimes of 'spontaneous' or apparently endogenous activity, is followed by (2) the appearance and development of initial, rather generalized, social responses which, passing through an early plastic period, become strengthened, fixated, directed, and specified by social experience. This period of increased social discrimination is followed by (3) a period of gradually increasing social independence that may result in break-up of the family, and finally (4) reintegration into new social groups, a process which in most species of birds seems to be largely governed by the preceding socialization within the family and by the balance between cooperative and competitive tendencies. Social development is greatly facilitated by example and leadership" (p. 156). Bibliography of 54 titles.—Ralph S. Palmer.

23. Flocking Behavior in Birds. J. T. Emlen, Jr. 1952. *The Auk*, **69**(2): 160-170. From the social viewpoint, in many situations birds like to be near one another—but not too close—and any balance achieved as to distance is dynamic, not static. From hormonal experiments it "appears that flocking responses have their physiological basis in stereotyped neural patterns and are influenced by hormonal factors only as these incite disruptive responses associated with sexual or parental activity" (p. 166). Environmental factors are discussed on the basis of two rhythms, seasonal and diurnal, which have their correlates (such as light, temperature, precipitation), which affect the nature and composition of bird flocks. Bibliography of 27 titles.—Ralph S. Palmer.

24. Social Behavior and Survival. F. Fraser Darling. 1952. *The Auk*, **69**(2): 183-191. An animal cannot truly stand alone. Darling deals with sociality in relation to (1) maintenance of everyday activities and (2) reproduction. A striking example of the first type is the Flamingo, *Phoenicopterus ruber roseus* Pall., which is reported never to feed alone unless ill or injured. The intricate structure of bird flocks in which several species are associated has not been thoroughly studied, but evidently there is survival value in maintaining such aggregations. There is more evidence for the second category—the social factor in relation to reproduction. Examples are discussed. Many birds have a highly developed social aggressive display—formalized actions, not true "aggressive behavior"—and it serves as a stimulus to reproduction. As to territoriality, "one pair of warblers in a wood have, in effect, no territory at all; they are merely existing in space" (p. 190). Aggressive display exists and many birds prefer to nest near the "defended" boundaries of others and are less interested in neutral margins. "If this hypothesis is correct, then *territorial behavior as a whole is a social phenomenon, and it has survival value*" (ibid.; author's italics). The reviewer recalls that Friedmann stated (1935, *Handb. of Social Psychol.*, p. 182): "On the whole, most birds, at least when not breeding, prefer not to be alone." Burkholder (1952, *Amer. Scientist*, 40: 601-631) has shown that cooperative relationships are important among primitive organisms, a state of affairs that evidently applies throughout, and even outside, the animal kingdom.—Ralph S. Palmer.

25. Observations on Barbary-Doves Kept at Semi-Liberty. Derek Goodwin. 1952. *Avicultural Magazine*, **58**(6): 205-219. Very interesting account of behavior of Ring Doves, *Streptopelia risoria*, with notes on training the birds to come to food at call. This species has very little homing ability and "even after years of liberty may be hopelessly lost less than a quarter of a mile from its home." "The display flight of the male is similar to that of most 'turtle-doves.'

. . . I shall never forget the thrill I felt when I saw a bird which had been free only a few minutes perform this flight, which almost certainly neither it nor its ancestors for many generations had previously been able to do." These doves "react to the alarm notes or alarmed behavior of passerine birds." Different predator reactions are described. The "coo is always a note of self-assertion."

These doves are devoted mates and parents. In homosexual pairs, the birds "show behavior patterns *that are common to both sexes*, but that one sex usually indulges in to a much greater degree. "In the one case of paired male doves and one of male Pigeons, *Columba livia*, "in neither case was there anything to suggest that one of the partners was 'cowed' by the other, and they both continued to show characteristically masculine behavior." The two Barbary Doves were nest mates, kept together with no other doves until October, then put with three other young doves and two adult females paired to each other. By spring, there was one pair of males, two pairs of females and "an odd hen who was making frantic attempts to get herself paired to one or both of the two males. It was evident that "the mutual fondling and nest-calling on the nest-site plays a more important role in maintaining the pair-bond than does the mating ceremony." Mr. Goodwin gave eggs to the brothers and they hatched them and raised the young; it took a little time for them to "learn" to cover the eggs at night. Sketches are given of seven postures, among them the "Aggressive posture" and "Defensive threat posture" of adult and young. In the latter "the bird puffs out all its feathers, raises the far wing, may spread its tail on the side towards the enemy, and strikes out with the near wing. This form of threat, the effect of which is to make the Dove look as large and terrifying as possible, is common to other Doves and Pigeons, and is shown by disturbed nestlings from an early age." "The above behaviour is shown when the bird seems to be torn between fear and anger, or, to speak ethologically, when its escape drive and aggressive drive are simultaneously activated." The article is full of valuable details and vividly shows how much can be learned from birds kept in freedom in contrast to those in cages.—M. M. Nice.

26. A Comparative Study of the Voice and Some Aspects of Behaviour in Two Old-World Jays. Derek Goodwin. 1952. *Behaviour*, 4(4): 293-316. Observations for some years on wild and captive European Jays, *Garrulus glandarius* and for 18 months on captive Lanceolated Jays, *G. lanceolatus* showed that most of "the calls are homologous in function and very similar in sound." The lateral (intimidation) display of both is "similar in form and function." The "chin-up" or appeasing display is very definite in *lanceolatus*, less so in *glandarius*. The wing-quivering submissive or pre-coitional display is often seen in *glandarius* in both sexes in an "imploring" sense, but in *lanceolatus* was noted only in this latter sense, given twice by a male. With *glandarius* the female often feeds the male early in the breeding cycle, but in *lanceolatus* this was not seen. Both species mobbed their owner when he held a jay or jay feathers in his hand, but this reaction cannot "normally be elicited from tame *glandarius* that are reacting socially to their owner." When anting, *glandarius* does not pick up ants in its bill as do most passerines, but *lanceolatus* and the Blue Magpie, *Urocissa erythrorhyncha*, both do so. "In inexperienced birds there is evidence that the stimulus releasing the actual anting movement is tactile rather than visual." Two young birds started anting when the insects swarmed up their legs. Sketches are given of many of the displays. A most interesting contribution to comparative ethology.—M. M. Nice.

27. Light Intensity and Waterfowl Flight; Pre-flight Activities. Hervey Brackbill. 1952. *The Wilson Bulletin*, 64(4): 242-244. Times of evening departure, presumably for migratory flight, by waterfowl from a reservoir in Baltimore, Maryland, during the spring and fall months of 1938 to 1942, are presented. Species are listed separately with departure times given in relation to sunset and cloud conditions. Within a species, departures on cloudy evenings were practically always earlier than on clear evenings. Observations are available on the following species: Pied-billed Grebe, *Podilymbus podiceps;* Scaup, *Aythya* sp.; Bufflehead, *Bucephala albeola;* Old-squaw, *Clangula hyemalis;* Ruddy Duck, *Oxyura jamai-*

censis; Coot, *Fulica americana*; and one Ring-necked Duck, *Aythya collaris*. With the exception of one species, all birds showed a tendency to leave between 30 and 40 minutes after sunset. Three of four Old-squaws left before sunset. Either bathing or diving was an almost invariable preliminary during a period of from 1 to 30 minutes before departure.—L. R. Mewaldt.

28. The Ethology of the Muscovy Duck. (Zur Ethologie der Türkenente). Georg Steinbacher. 1953. *Die Vogelwelt*, 74(1): 7-9. *Cairina moschata* was reported by Heinroth (1910) as having no courtship and no family life, and was cited by Lorenz (1935) as representative of the so-called "lizard-type" of mating. Suspecting this behaviour might be due to crowded conditions of captivity, Dr. Steinbacher experimented in the Zoo at Cologne by giving his Muscovies plenty of room, dividing them into groups of one drake and two ducks, two drakes and four ducks, etc., each set on its own pond. The birds behaved entirely different from the way they were supposed to; dominant males drove away weaker males; while drake and duck showed a strong bond to one another, when a duck started to incubate the drake might seek another mate and attend her on nest-hunting expeditions, yet return to the first mate when she brought her ducklings to water. Later the author crowded some Muscovies into a small cage at night and found they behaved as Heinroth and Lorenz had described.—M. M. Nice.

29. Paper-Tearing by Birds. W. M. Logan Home. 1953. *British Birds*, **46** (1): 16-21. "The practice of entering houses and tearing paper, shown by various species of tits, has become widely known in Britain since the autumn of 1949, when the frequency of such attacks reached spectacular proportions." Blue Tits, *Parus caeruleus*, are the chief offenders. There were 1,564 cases of tearing of wallpaper, 199 of books and magazines, 114 of covers of books, 110 of name cards on doors, 106 of parchment and silk lampshades, and many other objects of paper, cloth or other material. The birds do not seem to be hungry. They are most prone to paper-tearing in dry autumns.—M. M. Nice.

30. A Possible Explanation of Paper-Tearing Behavior in Birds. R. A. Hinde. 1953. *British Birds*, **46**(1): 21-23. "The movements made by tits tearing paper are very similar to those made in tearing bark from a twig—an activity sometimes common in normal food-searching behavior." "It seems, in fact, as though the cardboard tops of milk bottles, wallpaper, and loose bark on a twig all possess certain characteristics which are capable of releasing this tearing movement." The author suggests that paper-tearing may be an expression of the food-searching drive, a useful activity for discovering new sources of food, even though the bird may not at the moment be hungry.—M. M. Nice.

31. The Behaviour and Breeding Biology of the Hebridean Wren. Edward A. Armstrong. 1953. *British Birds*, **46**(2): 37-50. In June 1951 Mr. Armstrong traveled to the Outer Hebrides to observe *Troglodytes troglodytes hebridensis*. "The Hebridean Wren's most distinctive characteristic is its song," which is "more interesting musically than that of the European Wren," *T.t.troglodytes*. "The duration of the phrase is commonly about four seconds but phrases with the double trill may last 5-6 seconds. . . . In regular territorial song there are 4-5 songs per minute." Young in one nest stayed at least 20 days. When frightened the bird "commonly seeks refuge in a small gully among the peat hags . . . squats there and ultimately hops and creeps through whatever cover there is. . . . It is an ecological adaptation appropriate to a particular kind of habitat." "In the nature of the pair-bond, nest-site selection and, possibly, the nest-invitation display, behaviour resembles the behaviour of the Shetland Wren rather than that of the European Wren." The latter is usually polygamous and the male seldom feeds the young in the nest; the Hebridean Wren seems to be monogamous and both parents feed the nestlings. "There is a correlation between polygamy in Wrens and habitats in which food is readily available. The races inhabiting relatively bleak areas tend to be monogamous but where *T.t.troglodytes* is resident in garden-woodland areas it tends to be polygamous."—M. M. Nice.

32. Adoption Experiments with Ringed and Kentish Plovers. (Adoptionsversuche mit Sand- und Seeregenpfeifern.) Hans Rittinghaus. 1953. *Journal für Ornithologie*, **94**(1/2): 144-159. Experiments were made by exchanging eggs of Ringed, *Charadrius hiaticula*, and Kentish Plovers, *C. alexandrinus*, (our representatives of these species are the Semi-palmated and Snowy Plovers). Eggs of the Kentish Plover were also given to Least Terns, *Sterna albifrons*. In all cases the young were imprinted on the foster parents. One Ringed Plover was successfully raised by Kentish Plovers, and one Kentish by Ringed Plovers. At two days a Kentish Plover knew the call note of his foster parents; at four days a Kentish heeded the alarm note of his foster parents and not that of his own species, and at this time his foster parents knew their adopted Kentish Plover chicks personally, refusing to hover others of like age. A Ringed Plover chick a few hours old paid no attention to alarm cries of his Kentish Plover foster parents, but rushed into hiding at an imitation of the Ringed Plover alarm note.

In neither experiment where Kentish Plover eggs were given to Least Terns were young raised, although the terns warmed the little plovers and tried to feed them fish, an offer which frightened the chick. One of these attempted to get under other incubating Least Terns, but was driven off. The foster parents searched for the two-day-old Kentish Plover when it had left the nest on expeditions to hunt food. There are four photographs of adult tern and baby plover. The author plans to continue these interesting experiments.—M. M. Nice.

33. Use of Caves by Hummingbirds and Other Species at High Altitudes in Peru. Oliver P. Pearson. 1953. *The Condor*, **55**(1): 17-20. This is an interesting account of the manner in which some hummingbirds survive the relatively long and cold nights on the 12,500 foot Peruvian plateau between the eastern and western Andes. Night temperatures drop below 0°C. nearly every night of the year. Daytime temperatures are usually between 12° and 18°C., however during the wet season (summer), when Estella Hummingbirds, *Oreotrochilus estella*, nest, late afternoon storms of snow, hail, and cold rain frequently restrict feeding time. In December 1951 and January 1952 females were found at night in caves, mine tunnels, and large crevices where temperatures were much more equable. Five esophageal and cloacal temperatures varied from 36° to 39.5°C., while one adult female found roosting in a torpid condition had a cloacal temperature of 14°C. There is evidence that the nests (13 found), placed on the walls and ceilings of the caves and tunnels, are used more than one year.

Other avian species found roosting at night in caves and tunnels were: Sparrow Hawk, *Falco sparverius;* Horned Owl, *Bubo virginianus;* Streaked Spinetail, *Leptasthenura andicola;* four kinds of ground tyrants, *Agriornis montana, Muscisaxicola rufevertex, Muscisaxicola cinerea,* and *Muscisaxicola frontalis;* Gray-headed Finch, *Phrygilus gayi;* and Bolivian Goose, *Chloephaga melanoptera.* None of these species was torpid or had a low body temperature.—L. R. Mewaldt.

WILDLIFE MANAGEMENT

(See also Number 11)

34. Investigations of Woodcock, Snipe and Rails in 1952. Special Scientific Report: Wildlife No. 18, U. S. Fish and Wildlife Service and Canadian Wildlife Service. No date or place of publication, 55 pp., photo-offset. This is a progress report on the investigations described in Report No 14 (reviewed in *Bird-Banding*, **23**: 183-84, October, 1952). It includes the following: "Introduction," by John W. Aldrich; "Wintering Woodcock Populations in West-Central Louisiana, 1951-52," by Vincent H. Reid and Phil Goodrum; "Woodcock Singing Counts — Eastern Canada, 1952," by Victor E. F. Solman; "Woodcock Census Studies in Northeastern United States—1952," by Howard L. Mendall; "Woodcock Singing Ground Counts in Delaware, Maryland, North Carolina, New Jersey, Pennsylvania, West Virginia, and Ohio," by P. F. English; "Woodcock Singing Ground Counts in Central Northern States in 1952," by John W. Aldrich; "Report on Woodcock Investigations in Massachusetts — Spring 1952," by William G. Sheldon; "Wilson's Snipe Wintering Ground Studies, 1951-52," by Chandler S.

Robbins; "Wilson's Snipe 'Singing' Counts in Eastern Canada—1952," by Victor E. F. Solman; "Winnowing Counts as a Measure of Wilson's Snipe Breeding Populations," by Chandler S. Robbins; "Wilson's Snipe Breeding Ground Studies in Northern States in 1952," by Chandler S. Robbins; "Wilson's Snipe Breeding Population Study at Grays Lake, Idaho — 1952," by Thomas D. Burleigh; and "Breeding Populations of Clapper Rail at Chincoteague, Va.—1952," by Robert E. Stewart.

The Services are to be commended on the omission of any author's name from the title page, thus helping to ensure proper recognition of the work of the various authors listed above. Another welcome innovation is a list of previous Special Scientific Reports on the inside front cover.

Dr. Aldrich's over-all conclusions from 1952 work are "that neither the Woodcock nor the Wilson's Snipe have changed materially their over-all population status in the last few years; that devising wintering ground inventory methods for both species is beset by the difficulty of sampling a population which winters in different places in different years, depending on moisture conditions; that the timing of breeding ground inventories of Wilson's Snipe must be later than previously supposed to avoid counting migrant birds; that neither the time of day nor the calendar time best for censusing woodcock is suitable for censusing snipe; and that the movement of woodcock from one singing ground to another may be greater than previously supposed and would enter an important variable to be considered in interpreting the inventory data."—E. Alexander Bergstrom.

35. A Pheasant Breeding Population Study on Irrigated Lands in Southwest Idaho. Herbert E. Salinger. 1952. *Journal of Wildlife Management*, **16**(4): 409-418. An interesting comparison of the peak and success of nesting in hayfields and so-called permanent vegetation is made in this paper. The peak of nesting occurred two weeks earlier in permanent cover than in hayfields, but only 4 out of 29 non-hayfield nests hatched. Nevertheless, the high nesting losses and high mortality to both adults and juveniles in hayfields indicates the importance of permanent cover for nesting and rearing.—Helmut K. Buechner.

36. Techniques Used to Increase Nesting of Canada Geese. Charles F. Yocom. 1952. *Journal of Wildlife Management*, **16**(4): 425-428. Observing that Canada Geese, *Branta canadensis*, nested in abandoned nests of the Osprey, *Pandion haliaetus*, sportsmen in northern Washington placed old wash tubs and willow baskets at the tops of tall trees in an attempt to increase the breeding population. Although most of the artificial nests were used, it was not determined whether the practice augmented the productivity of Canada Geese. The accompanying photographs are interesting.—Helmut K. Buechner.

37. Variations in two Spring Indices of Male Ring-necked Pheasant Populations. Edward L. Kozicky. 1952. *Journal of Wildlife Management*, **16**(4): 429-437. Crowing counts and roadside counts of male Ringneck Pheasants, *Phasianus colchicus*, along a circuitous 10-mile route revealed: (1) no relationship between the effect of temperature, dew, and cloud coverage and the variations in crowing counts; (2) a decline of about 15 pheasant crows per station when the wind exceeded 8 mph; (3) a statistically significant difference (1 per cent level) in crowing counts made at 35 minutes before sunrise and those made 10 minutes after sunrise; (4) a significant difference (1 per cent level) in crowing counts made on different days, indicating that 9 random days were necessary for a reliable mean; (5) significantly (5 per cent level) more pheasants were recorded during roadside counts when dew was present; (6) a 10-mile minimum is necessary for reliable roadside counts; and (7) the variation associated with days was not significant for roadside counts. This paper is an important contribution toward an evaluation of the reliability of two important census techniques and suggests some valuable refinements.—Helmut K. Buechner.

38. Upland Farming as a Method of Supplementing the Natural Waterfowl Food Supply in the Southeast. Thomas Z. Atkeson and Lawrence S. Givens. 1952. *Journal of Wildlife Management*, **16**(4): 442-446. Where power-and-flood-control reservoirs are characterized by extreme fluctuations in water

levels, waterfowl populations are limited by the small production of natural foods. Spectacular increases in waterfowl populations have resulted from augmenting natural foods with farm crops. The most suitable types of crops for particular sites and the techniques for planting and harvest are discussed.—Helmut K. Buechner.

39. The California Quail in New Zealand. Gordon R. Williams. 1952. *Journal of Wildlife Management,* **16**(4): 460-483. From initial importations between 1860 and 1870, California Quail, *Lophortyx californica,* spread widely in suitable habitats on both North and South Islands through trapping and reliberation and natural dispersal. The birds are found in small numbers where the annual precipitation is 100 inches, but prefer areas where precipitation is less than 60 inches. Localities where the temperature is less than 50°F and rainfall exceeds 30 inches are avoided. Tussock grassland on the South Island, which at one time supported large populations of *Coturnix novae-zealandiae* (the extinct native quail), provides excellent California Quail habitat. Causes of mortality, types of habitat, population density, breeding, and food habits are discussed.

The paper contains much interesting information based on careful, first-hand observations. Breeding begins in late August or early September, nesting starts in late October, and most of the birds are hatched by late January, all of which represents a complete adjustment to the photoperiods and seasons of the Southern Hemisphere. Sex ratios show the usual preponderance of males in the adult class. Biometrical analyses of weights showed no significant difference between immature birds (4-5 months after hatching) and adults within each sex, but a significant sex difference, the males being somewhat heavier. No clear-cut evidence could be found to indicate the operation of either Allen's or Bergmann's rules in New Zealand.—Helmut K. Buechner.

40. The Effects of Aldrin on Birds. George Post. 1952. *Journal of Wildlife Management,* **16**(4): 492-497. Toxaphene and Chlordane in grasshopper control caused an increase in mortality among upland-game birds. Oral doses showed Aldrin to be 5 times more toxic to Ringneck Pheasants, *Phasianus colchicus,* than Toxaphene and 12.5 times more toxic than Chlordane. The application of 2.0 ounces of Aldrin per acre on shortgrass ranges caused little noticeable effect on avian populations, but resulted in excellent control of grasshoppers where populations of 6-7 grasshoppers per square yard prevailed.—Helmut K. Buechner.

41. Bobwhite Mobility in Central Missouri. Dean A. Murphy and Thomas S. Baskett. 1952. *Journal of Wildlife Management,* **16**(4): 498-510. This study was based on 402 Bobwhite Quail, *Colinus virginianus,* trapped over the 2-year period, 1950-1951. Of these birds, 136 provided 555 movement records. Summer movements of seven presumably unmated males form interesting closed figures, indicating that the birds were geographically oriented. During the summer, 88 per cent of the individuals remained within a half mile of the first summer trap sites. During the fall, only 61 per cent of the birds remained within a half mile of the last summer trap site, indicating increased mobility, but not an extensive "fall shuffle." Spring dispersal began in April and was completed by late May, with 74 per cent of the individuals being trapped or seen within a half mile of the last winter trapping site. A striking ingress of unmarked birds occurred in the spring of 1951; nearly half of the birds on the 2,240-acre study area in the spring had wintered outside the area. Of 45 birds providing lifetime cruising radii, 20 per cent remained within a quarter mile of the point of banding and 64 per cent remained within one-half mile. From these findings an area of four square miles was proposed as a minimum management unit for Bobwhite in central Missouri.—Helmut K. Buechner.

ECOLOGY

(See also Numbers 39, 47, 51)

42. The Relation of Metabolism to Climate and Distribution in Three Finches of the Genus Carpodacus. George William Salt. 1952. *Ecological Monographs,* **22:** 121-152. The responses of three morphologically similar species

to temperature and humidity and the correlation of these responses with the climates of breeding ranges are considered in this paper. The House Finch, *Carpodacus mexicanus*, occupies the lowland zeric plains and contiguous chaparral; the Purple Finch, *C. purpureus*, inhabits the ponderosa-pine forests of middle elevation; and the Cassin Finch, *C. cassini*, occurs at higher elevations at the edges of meadows associated with red fir, lodgepole pine, and white pine. While considerable mixing of populations occurs in winter at lower elevations, little overlap exists during the breeding season. Experimental material consisted of 20 House Finches, 12 Purple Finches, and 8 Cassin Finches acclimated at Berkeley, California, for a period of 3 months. This locality is marginal for the breeding ranges of the first two species and completely outside the range of the third species.

Because little or no fat was found in the dissected birds, it was assumed that fat plays a minor role in metabolism; it must be conceded, however, that this assumption is probably unsound. Single half-hour measurements were used to establish reference points for the metabolic curves. Curves were fitted by inspection without mathematical treatment to determine the best fit. The zones of thermoneutrality and shapes of the curves are therefore somewhat a matter of individual interpretation. Since the differences in metabolic patterns lie at higher temperatures, the adaptive mechanism involved seems to be one providing for heat loss. A considerable portion of the paper is devoted to an interpretation of assumed differences of heat loss through evaporation from moist surfaces in the respiratory tract, although no morphological or experimental evidence is provided to support the idea. The efficiency of peripheral circulation and the ability to control insulation are not considered.

The wide zone of thermoneutrality in the Purple Finch presumably indicates great powers of its cooling system in warm, moist air. The House Finch is assumed to have less evaporative surface than the Purple Finch, thus adapting it to high temperature where vapor pressures are low. House Finches require readily available water to replace moisture loss. Their lower metabolic rate may be important in adapting them to areas deficient in food. Respiratory surface is apparently a minor channel of heat loss in the Cassin Finch, as the bird functions most efficiently in cool climates at high elevations.

Excellent geographic correlations are shown between summer temperature and moisture and breeding ranges of the three species. Distribution is assumed to be according to the physiological limitations of the species as determined by the particular mechanism for body cooling. Each finch apparently finds its optimum climate where it can exist with the minimum loss of energy, thus providing surplus energy for reproduction and molting. While the experimental data support this hypothesis, the metabolic rates may not represent those of birds living under natural conditions, particularly for the Cassin Finch which was acclimated to conditions widely different from those of its breeding range.

Despite its inherent weaknesses, this paper brings out some challenging ideas and suggests directions for further studies along the same lines.—Helmut K. Buechner.

43. The Animal Community in the Nest of a White Stork in Lorraine. (Considerations sur une biocenose constituée autour d'un nid de Cigogne *Ciconia ciconia*, en Lorraine.) H. Heim de Balsac. 1952. *Alauda*, **20**(3): 144-156. An old Stork nest in a tree top was studied. Such nests consist of sticks, mud, fresh water algae and grasses; they remain moist and "may be considered as true 'hanging soils' in which a very peculiar animal association is found." In this nest 31 species of beetles, 1 bug, 1 ant, and 1 species of earthworm were found. Also a pair of Kestrels, *Falco tinnunculus*, and of Tree Sparrows, *Passer montanus*, were nesting in the lower part of the nest. "Such nesting associations are not uncommon in continental Europe, and other instances are discussed; even such rodents as common and fat Dormice have been found nesting with Buzzards and Herons." The author considers it a mistake to attribute this association as due to "expectation" of protection from the predacious birds. "The tolerance of the owners of the aerie towards their passerine commensals no doubt comes from the fact that the nest territory and the hunting territory release different behavior in predators."—M. M. Nice.

POPULATION DYNAMICS

(See also Numbers 21, 34, 37)

44. The Use of Banding Data in the Study of Certain Aspects of the Dynamics and Structures of Avian Populations. Donald S. Farner. 1952. *Northwest Science,* **26**(2, 3, 4): 41-50, 79-94, 119-144. Assuming certain basic premises, Farner has shown in a previous study (Age Groups and Longevity in the American Robin: Comments Further Discussion, and Certain Revisions. *Wilson Bulletin,* **61**: 68-80. 1949.) that avian survival patterns tend to follow a logarithmic regression curve, indicating a stabilization of the annual mortality rate at a value independent of age after an initial juvenile period of higher mortality. In the present paper, mean annual mortality rates are calculated using a formula developed by David Lack (modified by Farner) to weight properly the mortality data gathered from banding records. Another formula is given for constructing survival curves.

Farner's hypothesis of a constant mortality rate has a logical, sound basis. Inspection of data tabulated for a wide variety of species shows the tendency toward characteristic adult mortality rates which do not vary extensively with age to be common in birds, and apparently to be characteristic of populations within a given species as well as for the species as a whole. The constancy may be explained by the inter-compensating of the factors contributing to adult mortality. The fact that mean longevity is only a small fraction of potential longevity argues against senescence as an important cause of death.

Most of the available literature is summarized in an informative, systematic resumé of data on mortality based on the recoveries of banded birds. The author's interpretations of the data in this section are an invaluable contribution to the paper, which certainly should stimulate further research in this fascinating aspect of population dynamics.—Helmut K. Buechner.

PARASITES

45. Methods of Collecting Parasites of Birds. W. Buttiker. 1952. *The Ostrich* **23**(2): 92-93. A brief summary of recommended techniques for collecting, killing, labelling, and packing avian ectoparasites.—Hustace H. Poor.

46. The Fleas of Sea Birds in the Southern Ocean. B. de Meillon. 1952. Austr. Nat. Antarctic Res. Exp. Repts., Melbourne, Austr., Ser. B. Zool., I, pp. 1-11. **The Ticks of Sea Birds.** F. Zumpt. idem, pp. 12-20. These companion papers identify the avian ectoparasites collected by the Australian National Antarctic Research Expedition in 1949-50, and, far more importantly, summarize the little information available on the fleas and ticks known from pelagic birds, which present some very interesting distributional problems. One of the ticks, *Ceratoxides uriae*, has been collected from a wide variety of sea birds, mostly gulls, albatrosses, petrels, shearwaters, and penguins, which show no phylogenetic relationship. These hosts have a marked bipolar distribution which has given rise to the suggestion that *C. uriae* is a relic of a Tertiary fauna, but the authors point out the more likely hypotheses that the parasites could have been transported from either polar region to the other by one of the several bi-polar migrants among its known hosts. Another tick, *Ornithodorus talaje*, common in penguin nests around the South African coast, is normally parasitic only on South American rodents. The penguins are also parasitized widely throughout their Antarctic range by two genera of fleas, *Parapsyllus* and *Listronius*, members of a sub-family of eight genera which, except for those occurring on the penguins, are confined entirely to South American rodents. Penguins are generally thought to have evolved over a wide area among the waters and islands of the South Temperate Zone from flying sea bird ancestors. de Meillon believes the ectoparasitic evidence indicates "the ancestors of the present-day penguins . . . [arose] in a 'definite center,' namely the South American Subantarctic which is so rich in their fossil remains," and that in order to acquire a rodent flea as a parasite, the "protopenguin" must have been a ground-breeding, non-flying land bird.—O. L. Austin, Jr.

47. Bird-Insect Nesting Associations in Australia. A. H. Chisholm. 1952. *The Ibis*, **94**(3): 395-405. In Australia five species of warblers *(Gerygone)* are known to associate with wasps in tropical areas; another is reported to associate with wasps in tropical and ants in temperate areas. Evidently the relationship is deliberately sought by the birds and tolerated by the insects. Various possible explanations of this relationship are discussed; the author concludes: "If protection is the motive, it would seem to be aimed against reptiles rather than against other birds or mammals." Insects in birds' nests are classified as (1) parasitic on nestlings, (2) nest-cleansers and scavengers, and (3) insects parasitic on other insects in nests. The data on each category for Australia are summarized. Some insects probably find the nests at appropriate times by odor, others by some undetermined influence. The bibliography of 31 titles is intended to cover all the important Australian references to these matters.—Ralph S. Palmer.

48. Moth Larvae in Birds' Nests. K. A. Hindwood. 1951. *The Emu*, **51**(2): 121-133. Seven species of Australian moths are discussed and illustrated. Larvae of two feed on feces of parrots, a third on those of finches, and the other four apparently have less restricted feeding habits; they probably feed on a variety of organic waste. Larvae of the two species of *Neossiosynoeca*, discussed at length, are totally dependent on their parrot hosts and are tolerated by them; by consuming feces that soil the nests the larvae may be functioning to the advantage of the birds. Feeding on feces is rare among Lepidoptera.—Ralph S. Palmer.

FAUNISTICS

(See also Numbers 34, 41, 64)

49. The Birds of New Brunswick. W. Austin Squires. 1952. The New Brunswick Museum, Monographic Ser. No. 4, 164 pp., 12 photos, 1 map ($2.00). Introductory pages (3 to 17) summarize previous ornithological work in New Brunswick and deal briefly with geography, climate, bird-banding, and local migration routes. The annotated list includes 331 species and subspecies known to occur or to have occurred in that province, and an additional 23 forms erroneously or unsatisfactorily recorded. Seasonal and relative numerical status, and local distribution are given for each form of regular occurrence, together with nesting dates for most breeders. Evidence of the occurrences of accidentals and irregulars is definite and documented. Many of the old records were investigated, their validity re-appraised, and reasons for accepting or rejecting each are given. Data are well-organized and succinctly presented and documentation is unusually satisfactory. Obviously the author has searched the literature painstakingly and consulted many unpublished manuscripts, as well as data labels on hundreds of New Brunswick specimens in a number of institutions. The few points that might be questioned include: the referring of breeding American Redstarts to the nominate race instead of to *Setophaga ruticilla tricolora* which seems to be the breeding form in most if not all the province; the treatment of *Vireo olivaceus* as polytypic, also a *lapsus*; the assigning of White-fronted Geese on geographic grounds without eliminating the possibility that the specimens might have been of the Greenland race; under American Brant *(Branta bernicla hrota)* the season in New Brunswick is given "August 25 to June 17," an oversight as it is not known to winter. There is a 19-page bibliography, an index, and a map. This fine work very satisfactorily brings our knowledge of New Brunswick birds up to date and fills a need of long standing.—W. Earl Godfrey.

50. Birds of Washington Park, Albany, New York. Dayton Stoner and Lillian C. Stoner. New York State Museum. Bulletin No. 344. September, 1952. 267 pp., illus. 1 map. Concerned primarily with the vernal migrations as observed in a park close to the downtown district of a large city, the authors have compiled records over the period 1933 through 1942, with some additional material extending into 1946. The senior author died in 1944. The list of 122 species comprises the authors' own statedly conservative sight records, excludes the records of other observers and is not necessarily complete, but does, thereby, avoid the difficulties

inherent in the evaluation of such sight records. No attempt is made to cover previously published material, although five additional species are mentioned. Numerous photographs, taken for the most part by the senior author, illustrate appropriately the written description of the park. Various tables are devoted to migration dates and relative frequency.

Scientific nomenclature is based on the A. O. U. Check-List as revised through 1948 but names, in this compilation of sight records, might better have been restricted to binomials. The text under each species, in addition to comments directly pertaining to the observations recorded, has been greatly expanded to cover briefly field identifications (which seems unnecessary in view of the excellent field guides now available), and such features as distribution, nesting, voice, food, behavior, enemies and economic status. The composite whole is a short treatise built up around a check-list to provide beginners, presumably those in the immediate vicinity, with a bit of elementary knowledge of the subject as a whole and on each species individually. The accent is on protection and conservation.—Wendell Taber.

51. Black-capped and Carolina Chickadees in the Southern Appalachian Mountains. J. T. Tanner. 1952. *The Auk*, **69**(4): 407-424. This is a most interesting comparative study of *Parus atricapillus* and *P. carolinensis;* to human eyes they differ little in appearance and general habits, but there are ecological differences. Most observers find song the best distinguishing field character. Hybridization, if it occurs, apparently is rare. In general, the Black-capped species nests at higher elevations in the region studied. "Carolina Chickadees are found at lower elevations; they do not nest at higher elevations wherever Black-capped Chickadees are present; but where the latter are absent, Carolinas nest sparsely as high as 5,000 feet. In the Great Smoky Mountains there is a gap between the nesting range of the two species, wherein neither one nests. In the spring, this gap is occupied by Black-capped Chickadees which behave as if they were going to nest, but which disappear from these areas about the time that the Carolina Chickadees begin incubation. These facts indicate: (1) that there is some form of competition between the two species, that operates during the early nesting season; and (2) that the presence of Black-capped Chickadees prevents the Carolinas from inhabiting the higher parts of these mountains" (p. 424). The problems brought to light by this study could not be answered satisfactorily.—Ralph S. Palmer.

52. Bibliography of Chinese Birds. Masauji Hachisuka. 1952. Quarterly Journ. Taiwan Mus., **5**(2&3), pp. 71-209. Taipei, Taiwan, China. Comprehensive bibliographies are one of the working naturalist's most useful tools, and especially so when they are annotated as amply as is the present volume. Hachisuka has laboriously ferreted out all the major and most of the minor titles known on the subject, and has managed to unearth an amazing number of rare, little-known local publications of limited distribution. His abstracts of these will prove indispensable to others working on Asiatic birds. Western ornithologists will be particularly grateful for his English abstracts of the works in oriental languages. The volume's lack of contrast in its format makes it difficult to use, and it is rather carelessly edited and proof-read, but these minor faults are understandable and excusable under the circumstances, and in no way detract from the work's tremendous usefulness and value.—O. L. Austin, Jr.

53. Starlings as Winter Residents in the Uinta Basin, Utah. Merlin L. Killpack and Don N. Crittenden. 1952. *The Condor*, **54**(6): 338-344. Starlings, *Sturnus vulgaris*, although not yet known to breed in Utah, have been appearing as winter residents in increasing numbers at least since 1947. In the Roosevelt area of the Uinta Basin of northeastern Utah, 75 birds were observed in 1947, approximately 450 in 1948, about 700 in 1949, and in 1950, over 1000 birds in a single flock were seen on several occasions. Three birds banded in Roosevelt were recovered in the same locality, two more than a month after banding and one two weeks after banding. These recoveries of banded birds confirm observations which suggest that at least some of the Starlings remain as winter residents.

Weather conditions did not seem to influence the time of arrival in early November. The last Starlings were seen in the study area about the first week of April each year. Some of the Starlings roosted with English Sparrows, *Passer domesticus*, in holes dug in the roofs of open-fronted, straw-thatched cattle shelters. An analysis of the contents of 95 stomachs from the Roosevelt area revealed the major foods in order of importance to be (1) Russian Olive fruits, *Elaeagnus angustifolia*, (2) grains, (3) garbage, and (4) corn silage.—L. R. Mewaldt.

SONG

(See also Numbers 26, 31)

54. The Matin Song of the Eastern Kingbird. Winifred (Smith) Mayer. 1952. *Passenger Pigeon*, **14**(3): 91-94. The "twilight song" of *Tyrannus tyrannus* was recorded at Two Creeks, Wisconsin on 45 mornings in 1949 from May 23 to Aug. 27. Two Kingbirds had arrived May 10, a third May 13, but there was no song until May 24th, the day after the arrival of the fourth Kingbird. Neither pair started nesting before early June. On clear mornings the song begins about 15 or 20 minutes before Civil Twilight. "In June the average initiation of the song occurred at 3:07, and the average duration was 47 minutes. In July the average starting time was 3:30, ranging from 3:10 on July 3rd to 3:45 on July 30th. The duration averaged 38 minutes. During August the starting time averaged 4:20, duration about 20 minutes of early morning singing. At this time, however, the song was frequently heard during the day. The song was heard with regularity all during the nesting season, after the young had fledged, and while the adults were molting." Charming sketches are given of the tumbling flight that may precede the song and also of the bird's attitudes while singing. By far the most detailed study yet made of the Kingbird's matin song.—M. M. Nice.

55. Variation in the Song of the Chaffinch *Fringilla coelebs*. P. Marler. 1952. *The Ibis*, **94**(3): 458-472. Using a simple method (which is described) of transcribing the song trill and terminal phrase, the author gathered data on the Chaffinch on the island of Pico, Azores, in the Seine Valley, France, North Lancashire and middle parts of the Thames Valley, England, and in the southern Scottish Highlands. He also converted, and then made comparisons with, the data of Promptoff (1930) from Moscow and the West Urals. Trill and phrase are highly variable at any one locality. Some song types are much more common than others. "It is shown statistically that geographical variation of song between the separate regions occurs and that the songs characteristic of any one area can only be described in statistical terms. The suggested existence of song types confined and exclusive to a particular region cannot be substantiated, although this condition is approached in one case" (p. 471). In this species some characteristics of song are inherited, although it acquires others by learning. "It is inferred from its phenotypic nature that the geographical variation of the Chaffinch song cannot still be regarded as an example of incipient speciation" (ibid.). Marler's findings are contrary to those in Promptoff's oft-cited paper.—Ralph S. Palmer.

SYSTEMATICS AND TAXONOMY

(See also Numbers 46, 64)

56. Classification of the Anatidae Based on the Cyto-genetics. Y. Yamashina. 1952. Papers from the Coordinating Committee Res. Genetics, III: 1-34. Toyko. The chromosomes of birds are among the most difficult of all animal chromosomes to study. They are small and very numerous. Even today the foremost students still argue whether birds have visible sex chromosomes, as the majority believe, or not, as insisted by such an authority as Matthey. The finest technical work on vertebrate chromosomes in recent years has perhaps been done by Japanese cytologists and we must be grateful that they are now applying their excellent techniques to a revealing analysis of bird chromosomes. Yamashina, in a series of valuable papers on pigeons, pheasants and ducks, has greatly enriched

our knowledge. His careful descriptions and illustrations of bird chromosomes have lasting value and will form the basis of all future work in this field.

The interpretation of his findings, on the other hand, is a matter open to discussion. Yamashina's basic concept seems to be that changes in chromosome morphology exactly parallel total evolutionary change. This in itself is a questionable thesis, since in some groups of animals and plants rather far-reaching evolution has taken place through gene mutation alone (or with cryptic chromosomal rearrangement) without conspicuous chromosomal changes. Furthermore, Yamashina interprets his findings as if certain chromosomal differences were quite fundamental, as for instance the fusion of two rod chromosomes into a V-shaped chromosome, while it is known to students of *Drosophila* and other animals that such changes may occur among closely related species. Subspecies of a single species may differ in this respect, such as *Drosophila a. americana* and *D. a. texana*. In fact Yamashina himself shows in some cases how little this difference means. Finally, he considers degree of fertility as a basic criterion of relationship, while again all the recent work indicates that close relatives may be sterile and distant ones fertile. Degree of fertility is no more than one of many characters. It is useful if added to other known characters, but misleading as the basis of a single-character classification.

Many of Yamashina's findings confirm recent taxonomic results: *Aix* and *Cairina* are found to be closely related, *Casarca* to be congeneric with *Tadorna*, *Spatula* with *Anas*. Others are in disagreement. For instance, he finds no conspicuous cytological differences between *Anas*, *Aythya*, *Bucephala*, *Clangula*, *Histrionicus* and *Melanitta*. The third chromosome of *Mergus* is about 15 per cent shorter than that of *Anas* and all *Mergus* chromosomes are rather thick and short. Far more interesting and important is the discovery of a pronounced chromosomal difference between swans and geese. He shows that the Anserinae *(Anser* and *Branta)* have a basic chromosome number (each V is counted as consisting of two rods) of 90 in the male, 88 in the female, and the sex chromosome is V-shaped. All other ducks so far studied, including the swans, have a basic chromosome number of 84 in the male, 83 in the female, and the sex chromosome is rod-shaped. *Dendrocygna*, *Anseranas* and *Cereopsis* have not yet been examined. This casts justifiable doubt on the classification of the swans with the geese by Delacour and Mayr, and other recent authors. This doubt is strengthened by a rather great behavioral hiatus between *Cygnus* and *Anser-Branta*.

Yamashina's peculiar interpretation of the significance of karyotype patterns leads him to an absurd classification of certain species. It has been known for a long time that the Wood Duck *(Aix sponsa)* and the Asiatic Mandarin Duck *("Dendronessa" galericulata)* do not produce hybrids in spite of their obvious close relationship. Yamashina now makes the interesting discovery that the Wood Duck has chromosomes very much like its other relatives (haploid males, 33 microchromosomes, 5 large rods, 2 large V-s), while the Mandarin has only rod chromosomes (33 microchromosomes, 9 rods). Here some of the rods are apparently a secondary condition, which is indeed a little more difficult to explain (than the fusion of two rods) but by no means unprecedented. To make matters more complicated, some sterility factors apparently developed in the course of the breakdown of two V-s into four rods. These two cytological events, breakage of two V chromosomes and appearance of sterility, by no means justify removal of *Aix galericulata* into a separate genus, much less into a separate subfamily, as done by Yamashina.

Yamashina's work is an important contribution both to cytology and to ornithology. It should be extended, as soon as possible, to as yet unstudied genera.—E. Mayr.

57. Geographic Variation in the Red-eyed Towhee of the Eastern United States. J. C. Dickinson, Jr. 1952. Bulletin Museum of Comparative Zoology, **107**(5): 273-352. This paper presents the results of a study of geographic variation in the populations of *Pipilo erythrophthalmus* which breed east of the Great Plains and range from the Gulf Coast and Florida north to southern Canada. Approximately 2300 specimens were examined and seven mensural characters were analyzed statistically. Iris color was given special attention in the south-

eastern portion of the range. Plumage color proved to be of less taxonomic value than measurements of size.

Of seven names which have been applied to the eastern towhees the author recognizes four: *P.e. erythrophthalmus* for the birds breeding north of northern Arkansas, Tennessee, northern Georgia, and North Carolina; *P.e. canaster* for those of Louisiana, Mississippi, central Georgia and central South Carolina; *P.e. rileyi* for the birds of the coastal Carolinas and southern Georgia, and *P.e. alleni* for the populations of peninsular Florida.

For the statistical analysis of geographical variation in wing length, tail length, etc., the material was separated into six samples; three samples divided east to west across the range of *P.e. erythrophthalmus* and one sample for each of the other races. As enough specimens were available (145 males of *canaster*, 100 males of *rileyi*, 82 males of *alleni)* for a subdivision of these groups, failure to do so gives the impression that recognition of these races preceded, rather than followed, the analysis of variation.

The statistical analysis is presented in tables giving the mean, its standard error, the standard deviation, the mean plus and minus one standard deviation, and the observed range. The calculations are also presented in well-done Hubbs-Perlmutter diagrams.

In the 2300 specimens, 165 had small white tips or spots on the wing coverts or scapulars as in the western and Mexican races. Dickinson supports this reviewer's recommendation for the merging of *maculatus* and *erythrophthalmus* (Sibley, 1950. Univ. Calif. Publ. Zool., **50**: 116-120). Seven specimens had the crown feathers tipped with rufous. This condition, also present in the western races, is indicative of the relationship to *Pipilo ocai* of Mexico (Sibley, *op. cit.)* but whether owing partly to recent introgression or only to common origin is at present undetermined.

One of the most interesting aspects of the paper concerns the population to which the name *rileyi* is applied. This population is apparently (the reviewer resists the inclination to say "obviously") the result of a secondary contact and subsequent introgressive hybridization between the Florida race *(alleni)* and the populations to the north *(canaster* and *erythrophthalmus)*. The Florida birds are relatively small and pale, and have the palest irides (yellowish-white or "straw" colored). *P.e. alleni* is apparently a relict island form which evolved during the Pleistocene when peninsular Florida was repeatedly cut off from the mainland by seaways. The pale color is correlated with the sand dune habitat, the small size is consistent with an insular origin and the pale iris is explainable as the result of random fixation ("Sewall Wright effect") which would have been operable in the small ancestral population of the Pleistocene Floridian archipelago. The rejoining of the Florida peninsula to the mainland permitted the secondary contact which has resulted in the present variational pattern of *rileyi*.

The analysis of iris color is the best single clue to the hybrid origin of *rileyi*. The map on page 351 indicates that in the range occupied by *rileyi*, iris color varies from red to straw yellow. A more detailed analysis of the geographic and individual variation in iris color would be most interesting and instructive. The high degree of segregation exhibited by the color of the iris indicates that it is controlled by fewer factors than size, for example, and its analysis is thereby simplified.

The desirability of recognizing a hybrid population like *rileyi* as a subspecies and applying a name to it is a debatable point which has troubled other systematists, including this reviewer. Even viewing *rileyi* as a "normal" race the size distinctions between *rileyi* and *canaster* do not in themselves seem sufficient as a basis for the recognition of *rileyi*. The difference in wing length is considered "significant" but it is considerably less in amount than the difference in wing length between the eastern and western samples of typical *erythrophthalmus*. The size of the tail spot is the principal basis upon which *rileyi* is separated from *canaster* which it most resembles. That this character should be regarded with suspicion is indicated by its coefficient of variability: 14.5 in males of *rileyi*, 14.8 in males of *canaster*. These figures are outside the range of reliable values and indicate rather high intraspecific variability. In *alleni* the coefficient of variability for the tail spot is 22.5 in the males and 22.6 in the females.

A valuable by-product of the analysis of geographic variation is that it provides a means for the determination of the area of origin of migrants and wintering birds. Most individuals of *P.e. erythrophthalmus* withdraw south of Tennessee. *P.e. canaster* moves but little; most *rileyi* either remain in the breeding range or winter in Florida, and *alleni* is largely sedentary.

This study is another which fits the definition of the "new systematics." The author has drawn ably upon the fields of ecology and geology, and has utilized the valuable tool of statistical analysis in explaining the patterns of variation he observed.—Charles G. Sibley.

58. The Relationships of Certain Birds as Indicated by their Egg White Proteins. R. A. McCabe and H. F. Deutsch. 1952. *The Auk*, **69**(1): 1-18. Egg-white proteins of fresh eggs of 37 species of birds were studied by a method termed electrophoresis; the technique is described. It was found that electrophoretic patterns, expressed in graphs, "show similarities in configuration between some of the birds that are considered closely related taxonomically. In other instances these patterns indicate a more distant relationship than is indicated in the present taxonomic position" (pp. 17-18). Also, "each species has a distinct pattern of its own. . ." (p. 18). This technique is thought to be suitable in augmenting present taxonomic procedure.—Ralph S. Palmer.

59. Notes on Some Petrels of the North Pacific. Oliver L. Austin, Jr. 1952. *Bull. Mus. Comp. Zool.*, **107**: 391-407. During a study of some petrels taken in Japanese waters, Austin was able to add considerably to our knowledge of the taxonomy of this difficult group. The Leach's Petrel *(Oceanodroma leucorhoa)* is revised and *O. monorhis* combined with it. It is shown that the size differences of *beldingi* and *willetti* are too slight to justify recognition. The *melania-markhami* complex is tentatively divided into four species, the characters and measurements of which are stated. It still seems possible that *tristrami* is conspecific with *markhami*. It is shown that the Madeiran Petrel *(O. castro)* is not separable into an Atlantic and a Pacific subspecies. Finally, a new arrangement of the gadfly petrels *(Pterodroma*, subgenus *Cookilaria)* is proposed. Separating *leucoptera* from *brevipes* is an attempt to break up the unwieldy *cookii* group, but Austin overlooked that Fleming (1941, Emu, **41**: 69-80) and Falla (1942, Emu, **42**: 111-118) had already revised this assemblage and broken it into four species which do not coincide with those proposed by Austin.

Since most of the differences between the actual and reputed subspecies of petrels is merely a matter of size, it is particularly profitable to apply statistical methods. This is done by Austin with notable success. As his criterion for recognizability he adopted the "84 per cent from 84 per cent convention."—E. Mayr.

MORPHOLOGY AND ANATOMY

60. The Incubation Patch of Passerine Birds. Robert E. Bailey. 1952. *The Condor*, **54**(3): 121-136. The macroscopic and microscopic structure of the incubation patch of passerine birds is described and its cycle traced through the reproductive season. Examination of 125 specimens of 12 families of passerine birds disclosed no significant differences in the structure of the patch.

Estradiol pellets implanted into White-crowned Sparrows, *Zonotrichia leucophrys*, produced an incubation patch in non-breeding birds of either sex, and prolactin injections speeded complete patch development in estradiol-treated normal birds. Prolactin alone or implanted testosterone pellets alone had no visible effect on the incubation patch area. Bioassays of the prolactin content of pituitaries of 28 California Gulls, *Larus californicus*, showed that gulls with incubation patches had more prolactin in their pituitary glands than those without patches. It is suggested that in passerine females, estrogen produced by the ovary shortly prior to ovulation results, by some direct or indirect mechanism, in increased prolactin production, and that the combined effects of estrogen and prolactin account for the formation of the complete incubation patches.

The author found an incubation patch in all nesting females he examined and states that he never found an incubation patch in a male passerine bird. He also states (p. 134) that androgen treatment should not be expected to result in vas-

cularity of the patch area of passerine birds ". . . since no males in this order have incubation patches." Prompted by this paper, the reviewer *(The Condor,* **54**(6): 361) has since made available data showing a high incidence of incubation patches in breeding male Clark's Nutcrackers, *Nucifraga columbiana,* a passerine species (included in the list of species examined) in which incubation duties are shared by the sexes. Determination of the physiological basis for natural formation of incubation patches in male birds (in species which develop patches) may prove a profitable approach to the over-all problem of incubation patch development.—L. R. Mewaldt.

61. More Bird Weights from Surinam. Fr. Haverschmidt. 1952. *The Wilson Bulletin,* **64**(4): 234-241. This listing of more than 470 bird weights from Surinam in Dutch Guiana, by sex and month of collection, for more than 180 avian forms is a continuation of the similar contribution by Fr. Haverschmidt in 1948 *(The Wilson Bulletin,* **60**(4): 230-239). The present list contains weights of a hundred additional species, many of them smaller birds from such families as Trochilidae, Formicariidae, Tyrannidae, Coerebidae, Thraupidae, and Fringillidae.—L. R. Mewaldt.

BOOKS

62. The Migration of Birds. (Vom Vogelzug. Grundriss der Vogelzugskunde.) Ernst Schüz. 1952. Verlag Dr. Paul Schöps, Frankfurt am Main, Germany. 232 pp. paper, DM 18.50; cloth, DM 22. This interesting book is a critical condensation of much of the information available on most aspects of bird migration. Although it will find its greatest usefulness among ornithologists and laymen in Europe, many sections will interest zoologists in general as well as investigators of avian migration. Although primary attention is directed to European species and European investigations, this is by no means pressed to the exclusion of significant material from elsewhere. Initial attention is given to the *methods* of investigating avian migration with discussions of direct observations, measurement of speed and altitude, banding and banding organizations, physiological investigations, and studies of orientation.

A substantial section (pp. 43-74) is used to present the migratory habits and routes of 14 selected species. Thereafter follow more theoretical generalizations on such topics as broad-front migration and the functions of *Leitlinien,* narrow-front migration, directions of migration in which the system of Geyr von Schweppenburg *(Ardea,* **36:** 219-257. 1949.) is adopted, "loop migration" *(Schleifenzug),* wintering areas, and vertical migration. There are brief generalizations (pp. 94-98) of the nature of avian migration on the principal land masses and an interesting account (pp. 98-106) of cases of particularly remarkable and unusual migratory behavior.

The author then turns to some of the more basic scientific problems of migration. With respect to its origin, he suggests that pre-Pleistocene movements existed, although the influence of the Pleistocene on present migratory patterns is profound. He believes its origin associated primarily with the developments of unfavorable Tertiary climates and of an annual periodicity in daylength. In an interesting discussion of intrinsic and extrinsic factors in the regulation of migration, he distinguishes between the selective extrinsic factors and those which exert immediate stimulatory effects. He proposes that the single term *Zugbereitschaft* (readiness to migrate) replace the older concepts of *Zugdisposition* and *Zugstimmung* of Groebbels. In general the discussion of the physiologic aspects of migration is the least satisfactory part of the book. But this is primarily a reflection of the generally unsatisfactory status of the basic physiology of migration. Considerable attention is given to the problems of partial migration, migration of non-breeding birds, changes of migratory behavior with age, etc. The discussion (pp. 132-150) of the effects of weather and meteorologic factors is an admirable assault on this almost hopelessly complex aspect of migration. Unusual among the treatises on migration is the interesting discussion (pp. 153-161) on invasion species.

The author's own research interests are displayed in the relatively extensive section on orientation with emphasis (pp. 166-185) on displacement experiments.

The author feels that the homing (to nest site) ability demonstrated by several migratory species cannot be explained adequately on the bases of the senses and mechanisms possessed by man. The mechanisms involved in orientation in migration may involve some type of inherited sense of direction, inherited reaction to particular landmarks, and the learning of routes by experience in species which migrate in flocks. Orientation involving perception of the earth's magnetic field and/or Coriolis force is regarded as unlikely, as are the kinesthetic theories. Of importance are the investigations of G. Kramer which indicate that Starlings have an inherited direction sense which probably involves the position of the sun and a feeling of the time of day.

Apparently because of space limitation, the bibliography is disappointingly brief, and some significant papers are omitted. Nevertheless this treatise is heartily recommended to anyone interested in bird migration.—D. S. Farner.

63. Post-egg Period in Albatrosses. L. E. Richdale. 1952. No. 1 Nuffield Publication. Biological Monographs, No. 4. Dunedin, New Zealand. 22/6 on direct order from author. 166 pp. Another notable monograph from Dr. Richdale, a companion volume to the "Pre-egg Stage in the Albatross Family," (1950). It is largely based on a 16-year study of the Royal Albatross, *Diomedea epomophora sandfordi*, on the Otago Peninsula, N.Z., but a great deal of material is offered on Buller's Mollymawk, *Diomedea bulleri*, from the author's seven weeks study of The Snares Island and on other albatrosses from observations by Robert Sheehan on Midway Islands, and from the literature. The mean span on the egg by one parent ranges from 6, to 10, to 14, to 21-30 days with different species of albatrosses. The total length of the incubation period lasts from 38 to 56 days in petrels, from 9 to 12 weeks in albatrosses. "The mean length of the guard stage in the Royal Albatross is 39.6 days, which is approximately 17 per cent of the total chick period." "The 17 Royal Albatross chicks, which have been reared at Tairoa Head, were ashore for a mean time of 236 days with a range from 216 days to 252 days." "The 1938 chick was fed on 48 per cent of its first 100 days after the end of the guard stage, on 79 per cent of its second 100 days, and 55 per cent in its last 31 days. *There is no starvation period in Royal Albatrosses* and probably not in other albatrosses; this myth started in 1865 and has lasted to 1951, although disproved in 1885, 1929, 1939 and 1942.

Six Royal Albatross fledglings have returned to their place of hatching at ages from four to eight years. One female bred for the first time in her ninth year. These Albatrosses normally breed every two years. "At Tairoa Head, two Royal Albatross mated pairs are still intact after 15 years." The oldest member of this colony is known to be at least 25 years of age. "The sex ratio at Tairoa Head is 100:76."

There are 28 excellent photographs, 7 graphs, 65 tables, a detailed summary, a bibliography, and two indices. An admirable example of intensive and extensive work on an exceptionally interesting group, an important contribution to our knowledge of breeding biology of birds.—M. M. Nice.

64. A Check List of the Birds of South Africa. Jack Vincent. 1952. Cape Times, Ltd., Parow, Cape Province. vi + 122 pp. 4s 8d. This check list covers the area south of a line running east from the mouth of the Cunene River to Victoria Falls and then along the Zambezi River to the coast. A table presents the arrangement of orders, suborders, families, and subfamilies followed in the body of the list. For each of the 1305 listed and numbered species and subspecies Vincent gives scientific and English vernacular names, first author, type locality, number as listed by Roberts *(Birds of South Africa*, 1940), and an extremely condensed summary of distribution within the area. Forms treated by Roberts which are omitted from the Check List are mentioned in footnotes with the reasons for exclusion.

In his technical review of this check list *(Bokmakerie* **4**(2): 40-41, Aug. 1952) C. M. N. White mentions the modern concept of the polytypic species and the current tendency to consolidate genera, and concludes that "the generic nomenclature of the new Check List is much sounder than that followed by Dr. Roberts but still by no means in keeping with modern trends. In specific nomenclature

and the arrangement of species, the new Check List has kept more abreast of modern changes. . ." The editor of *The Ostrich* has announced that scientific nomenclature in that journal will hereafter conform to the new check list with few exceptions.—Hustace H. Poor.

65. Waterfowl Banding 1939-1950 by Ducks Unlimited. Bertram W. Cartwright and Jean T. Law. 1952. Ducks Unlimited, Winnipeg, Manitoba, Canada, 53 pp., 15 tables, 4 maps. No price given. The subtitle proclaims this to be "A progress report covering banding operations by Ducks Unlimited during the period 1939-50 in Manitoba, Saskatchewan, Alberta and British Columbia and an analysis of recoveries from birds thus banded." At first glance it is an attractive and impressive booklet, crammed with authoritative-looking, detailed tables, and decorated with some nice pictures and four quite dramatic maps in three colors showing the locations of banding and recovery of the Pintail, Lesser Scaup, Mallard, and Blue-winged Teal respectively. Closer study, however, reveals it to be carelessly and inaccurately compiled, and biased in its selection and presentation of the data.

In the 12 years covered by this report, Ducks Unlimited's operators banded 61,868 ducks of 17 species, mostly Mallards (22,641), Blue-winged Teal (12,823), Pintails (10,028), and Lesser Scaup (6,566), from which a total of 6,793 recoveries had been received by June 1951, or 11 per cent of the bandings. The assemblage of the data in table and map form seems to have been done not so much to show the actual movements and population trends of the various species as to impress on the reader the importance of the Prairie Province breeding grounds to the maintenance of the sport of waterfowling in the United States. Only a selected few of the Canadian recoveries are given in the tables (most of these in an effort to prove an exclusively northward post-breeding movement instead of the normal explosive type of post-nuptial wandering that other omitted data might indicate), and none is shown on the maps. Recoveries south of the United States shown on the maps are omitted from consideration in the tables. The recoveries are tabulated in detail by flyways and by states to show the proportion of the Prairie Province's bounty each receives. While these tables and maps may carry weight in the council meetings deliberating open seasons and bag limits, they are no contribution to human understanding of the basic facts of waterfowl distribution and demography, which are the only possible foundation for sound game management.

Lest I be thought overharsh in my criticism of the scientific value of this report, let me point out just a few of its inconsistencies. The Blue-winged Teal will do for an example. Table IV claims (interpolating the percentages) that six were taken on the Atlantic Flyway—three in Florida, one in Maryland, one in New York, and one in South Carolina. The map showing recoveries for this species locates two in Florida, one in Maryland, one in New York, none in South Carolina, and two in Pennsylvania. Table XII, which postulates an easterly migration from the western breeding grounds, states that 17 of the Blue-winged Teal banded in the Prairie Provinces have been taken in eastern Canada and the northeastern United States. Table XIII shows these 17 selected recoveries to have been taken as follows: Ontario seven (not on map), Quebec three (not on map), Michigan five (map shows six), Ohio one (map shows three), New York one. It is gratifying to note no disagreement on the one bird taken in New York. Such discrepancies in the simple presentation of the material force distrust of the authors' selection and analysis of their data and nullify their conclusions.

Another peculiar (to say the least) section is the chapter (page 52) on "Longevity and Life Expectancy." Here 6,855 recoveries (were the 62 additions to the 6,793 listed on page 9 received after Table II was set in type?) are examined casually to see how long ducks live—not by species, as though that could make any difference, but just as ducks "in the aggregate of all kinds" as the hunting regulations say. After the publication of Hickey's excellent "Survival Studies of Banded Birds" (see *Bird-Banding* **24**: 26) which must certainly be available to Ducks Unlimited, it is difficult to imagine that the account on page 52 was published in seriousness and sincerity.

Ducks Unlimited has spent a great deal of money and man-hours on the banding of waterfowl, for which I suppose we should be properly grateful, but if this

report is any criterion, their efforts have been of negative value. The work is so full of errors and inaccuracies that one wonders whether even the specific identification of the birds they have banded can be trusted, to say nothing of the aging and sexing.

By its very incompetence this report emphasises the great need for a thorough, impartial, unbiased analysis of the immense amount of raw data now available from the waterfowl banding in North America, preferably by disinterested scientists not employed either by a hunting or "conservation" organization or by a government agency. The purpose must be to show coldly and factually what these records, the only reliable statistical evidence in existence on the subject, show about the status of our vanishing waterfowl, and then to present these truths in clear, simple language that both hunters and politicians can understand.

The comment has often been made that birds know nothing about political boundaries. It is also evident from a perusal of the tables and maps in this publication, faulty and inadequate though they be, that the ducks have not been told about the flyways they are to follow. Convenient as the flyway concept may be for the administration of waterfowl hunting, it is far from being demonstrated to be a natural phenomenon.—O. L. Austin, Jr.

NOTES AND NEWS

An old contributor returns to *Bird-Banding* in this issue, with Mrs. Day's paper on the Veery. As Mrs. Richard B. Harding (Katherine C.), she made 13 contributions to our predecessor, the *Bulletin of the Northeastern Bird-Banding Association*, in addition to two more written jointly with Mr. Harding. She also contributed to volumes I and III of *Bird-Banding* itself.

Preliminary indications are that several thousand Pine Siskins were banded in the northeast during the past winter, as well as substantial numbers of other winter finches. The banding done during this flight may have carried the fiscal year's total of Passerines banded to the highest level since the war.

While we are glad to be able to include a sizable number of general notes in this issue, we are prepared to enlarge this section even more if material is available. We are still able to allow very prompt publication of papers accepted for *Bird-Banding*, and the present supply is barely adequate. While a number of papers of major interest are in prospect, papers actually on hand as the July issue goes to press will not suffice to fill the October issue.

The General Secretary of the 11th International Ornithological Congress has sent the following preliminary announcement:

The 11th International Ornithological Congress, presided over by Sir Landsborough Thomson, London, will be held in Basel (Switzerland) from May 29th to June 5th, 1954.

During the week of the Congress, five days will be devoted to meetings and two to excursions. Before and after the Congress (May 25-28 and June 7-19) excursions will be arranged to enable members to become acquainted with the Swiss avifauna, especially of the Alps and Lower Alps. The Congress fee is 30 Swiss francs.

The prospectus, containing registration form and detailed information, will be distributed this summer. Applications to attend, and to contribute scientific papers, should be sent in before February 28, 1954, and addressed to:

XI International Ornithological Congress,
Zoological Garden, Basel, Switzerland

which is at disposal for any inquiries needed.

Basel, June 1953

Errata: In the April 1953 issue: (1) the maps on pages 46 and 47 were inadvertently interchanged and thus appeared over the wrong captions. The map on page 47 should have appeared on the previous page over the caption "Figure 2: Atlantic unit recoveries", and a corresponding correction should be made on page 46. (2) In the caption for Figure 7 on page 63, the reference should be to Figure 6 (immediately above) rather than to Figure 5.

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